University of Warsaw

Svetlana Keil

Organising for Smart Specialisation: hype or institutional change in innovation policy in Lithuania and Poland?

Doctoral dissertation

Dissertation written under the supervision of
dr. hab. Krzysztof Klincewicz, prof. UW
dr. Marcin Kardas
University of Warsaw, Faculty of Management
Department of Organization Theory and Methods

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Abstract

The dissertation concerns the processes of defining and implementing Research & Innovation Smart Specialisation Strategies (S3), key policy documents prepared by EU member states in 2014-2020. It adopts the neo-institutional theory perspective. The qualitative study, based upon 38 interviews with diverse stakeholders from Lithuania and Poland and document analysis, shows that the official S3 documents do not compensate for the deficits in the governance structures of an organisational field. They result in minor consolidation of funds. The leadership within a specialisation, the region's absorptive capacity, the institutional proximity to other regions and the activities of "boundary spanners" linking various stakeholders determine the policy convergence with the initial assumptions of S3.

Keywords

smart specialisation, entrepreneurial discovery process, innovation policy, institutionalisation, isomorphism

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Tytuł w języku polskim

Organizowanie na rzecz Inteligentnej Specjalizacji: krótkotrwała moda czy zmiana instytucjonalna w polityce innowacyjnej Litwy i Polski?

Abstrakt

Rozprawa dotyczy procesów tworzenia i wdrażania Strategii Inteligentnej Specjalizacji w obszarze Badań i Rozwoju (S3), kluczowych dokumentów politycznych przygotowywanych przez kraje członkowskie UE w latach 2014-2020. Praca rzyjmuje perspektywę teorii neoinstytucjonalnej. Badanie jakościowe, oparte na 38 wywiadach ze zróżnicowanymi interesariuszami z Litwy i Polski oraz analizie dokumentów, wskazuje, że oficjalne dokumenty S3 nie rekompensują deficytów w strukturach zarządzania pola organizacyjnego. Skutkują nieznaczną konsolidacją funduszy. Przywództwo w ramach specjalizacji, zdolności absorbcyjne regionu, bliskość instytucjonalna względem innych regionów oraz obecność osób lub organizacji, przekraczających tradycyjne granice pomiędzy interesariuszami, determinują zbieżność polityki z początkowymi założeniami S3.

Słowa kluczowe

inteligentna specjalizacja, proces przedsiębiorczego odkrywania, polityka innowacyjna, instytucjonalizacja, izomorfizm

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List of abbreviations

CATI – Computer-assisted Telephone Interviewing
CAWI – Computer-assisted Web Interviewing
CCP – Cluster Collaboration Platform
CEE – Central and Eastern Europe
CPVA – *Centrinė Projektų Valdymo Agentūra* (eng. Central Project Management Agency, Lithuania)
DESI – Digital Economy and Society Index
DG CNECT – Directorate-General for Communications Networks, Content and Technology
DG REGIO – Directorate-General for Regional and Urban Policy
DG RTD – Directorate-General for Research and Innovation
EC – European Commission
EFIS – European Future Innovation System Centre
EIMIN – *Ekonomikos ir Inovacijų Ministerija* (eng. Ministry of the Economy and Innovation, Lithuania)
EQI – European Quality of Government Index
ESIF – European Structural and Investment Funds
EU – European Union
FP7 – EU's Seventh Framework Programme for Research and Technological Development
GT – Grounded Theory
GTM – Grounded Theory Method
GUS – *Główny Urząd Statystyczny* (eng. Main Statistical Office, Poland)
HEI(s) – Higher Education Institution(s)
HORIZON2020 – The EU Framework Programme for Research and Innovation (2014-2020)
INTERREG – Interrregional Policy Learning Platform (an action of the Interreg Europe programme)
IPRI – International Property Rights Index
JRC – Joint Reseach Centre
KET(s) – Key Enabling Technology(-ies)
KIS – *Krajowa Inteligentna Specjalizacja* (eng. National Smart Specialisation, Poland)
LT – Lithuania
LVPA – *Lietuvos Verslo Paramos Agentūra* (eng. Business Support Agency, Lithuania)
MITA – *Mokslo, Inovacijų ir Technologijų Agentūra* (eng. Science, Innoation and Technology Agency, Lithuania)
MoE – Ministry of Economy, Poland (Polish names changed frequently: at the time of introducing S3: *Ministerstwo Gospodarki*; 2015–2018: *Ministerstwo Rozwoju;* 2018-2021: *Ministerstwo Przedsiębiorczości i Technologii;* since October 2021 *Ministerstwo Rozwoju i Technologii*)
MOSTA/STRATA – *Mokslo ir Studijų Stebėsenos ir Analizės Centras/ Vyriausybės Strateginės Analizės Centras* (eng. Strategic Analysis Centre, Lithuania)
NACE – *Nomenclature Statistique des Activités Économiques dans la Communauté Européenne* (eng. the European Statistical Classification of Economic Activities)
NCBR – *Narodowe Centrum Badań i Rozwoju* (eng. the National Centre for Research and Development, Poland)
OECD – The Organisation for Economic Co-operation and Development
PARP – *Polska Agencja Rozwoju Przedsiębiorczości* (eng. Polish Enterprise Development Agency)
PFR –*Polski Fundusz Rozwoju* (eng. Polish Development Fund)

PKD – *Polska Klasyfikacja Działalności* (eng. Polish Statistical Classification of Economic Activities)
PKWiU – *Polska Klasyfikacja Wyrobów i Usług* (eng. Polish Statistical Classification of Products and Services)
PL – Poland
POIR – *Program Operacyjny Inteligentny Rozwój* (eng. Operational Programme Smart Growth, Poland)
POWER – *Program Operacyjny Wiedza, Edukacja, Rozwój* (eng. Operational Programme Knowledge, Education, Development, Poland)
PPI - Public Procurement for Innovation
R&I – Research and Innovation
RCA – Revealed Comparative Advantage
RDF – Regional Development Funds
RIS3 Guide – Guide to Research and Innovation Strategies for Smart Specialisation (RIS3) (issued by European Commission, 2012, CEC, Brussels)
RIS3/S3 – Regional Innovation Strategies for Smart specialisation/ Strategies for Smart specialisation
ROP – Regional Operational Programme(s)
RTOs – Research and Technology Organisations
S3/RIS3 – Regional Innovation Strategies for Smart Specialisation/ Strategies for Smart Specialisation
SIEE – Strategy for Innovation and Efficiency of the Economy "Dynamic Poland 2020"
SF – Structural Funds
SMEs – Small and Medium-sized Enterprises
SMM – *Švietimo, Mokslo ir Sporto Ministerija* (eng. Ministry of Education, Science and Sport, Lithuania)
STED – Science, Technology, and Experimental Development
STRATA/MOSTA – *Vyriausybės Strateginės Analizės Centras/ Mokslo ir Studijų Stebėsenos ir Analizės Centras* (eng. Strategic Analysis Centre, Lithuania)
TRL – Technology Readiness Level

1. Introduction

This chapter aims to introduce the reader to the dissertation topic and outline the structure of the thesis. It starts with positioning the research topic in the field of management and organisation theory, relating it to the specific setting of innovation studies and public support for innovation. It also introduces neo-institutional theory with its core concepts as a perspective to study change. The chapter also clarifies core concepts used in the thesis related to a specific research setting, *regional innovation strategies for smart specialisation* (RIS3, also abbreviated as S3). It provides a brief overview of the research streams on S3, aiming to identify the research gap, which the current thesis intends to fill. Consequently, it outlines the research purpose and problem and introduces research questions, discussing the significance and contribution of the research. Finally, it provides an overview of the thesis.

1.1. Research topic

The topic relates to the field of innovation studies and, more specifically, public support for innovation. The Oslo Manual defines innovation as "a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)" (OECD/Eurostat, 2018, p. 20). Public intervention aiming to support the generation and diffusion of innovation is commonly known as innovation policy (Edler, Cunningham & Gök, 2016).

The field of innovation studies started developing in the second half of the 20th century. The ground has been laid by the Austrian-American scholar Joseph Schumpeter (1883-1950), who was among the first to address innovation-related themes in his works (Fagerberg & Verspagen, 2009). After World War II, innovation was associated with progress and became a *panacea* for economic problems of different kinds and a *magic word* (Godin, 2015). Researchers note that along with the increasing presence of innovation in the economic policy agenda, academic research generated various innovation models to support governments and policy-makers in their endeavours (Fagerberg & Verspagen, 2009; Godin, 2015). However, their enduring impact could be deemed under-researched. Thus, the fashion perspective in management studies demonstrates the rising and subsequently falling popularity of the management concepts that promote specific approaches (Abrahamson, 1991; 1996; Abrahamson & Fairchild, 1999). The field of innovation policy might be no exception to this rule. In this context, it would be crucial for academic research to assess the

relevance of proposed models and concepts in the empirical setting to understand possible antecedents and limitations for their applicability.

Therefore, the current thesis aims to explore under what circumstances adopting specific forms of organising in response to pressures might lead to persistent change in innovation policy practice. The empirical context is analysed through the lens of neo-institutional theory. The neo-institutional theory considers the influence of the existing rules, norms, and cultural aspects on organisations (addressed as institutions). It also concerns how organisations respond to these pressures (addressed as actions). Hence, there is an interaction between institutions and actions (Hall & Taylor, 1996).

Regional Innovation Strategies for Smart Specialisation (further: S3) represent an approach, which has been developed based on the ideas of renowned economists (see: Hausmann & Rodrik, 2003; Rodrik, 2008). It rapidly got on the innovation policy agenda in the European Union (EU). Consequently, it appeared as an *ex-ante* conditionality for accessing the European Structural and Investment Funds (ESIF) during the EU financial programming period 2014-2020. S3 has also been paired with particular requirements for their development and implementation, making it a suitable setting to study what potential an initially academic concept might have to change policy practice. Neo-institutional theory provides a theoretical background for the study.

1.2. Research background

1.2.1. Introduction to the theoretical perspective

The neo-institutional theory has become a highly influential and widely adopted perspective in management and organisation studies. North defines institutions as “the humanly devised constraints that structure political, economic and social interaction” (North, 1991, p. 97). According to North, taboos, customs or traditions are examples of informal institutions, while, e.g., laws or property rights are formal institutions. “Institutions comprise regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life” (Scott, 2014, p.56). In the context of innovation studies, as Edquist (2005) puts it, institutions are “rules of the game”, and organisations are “players or actors”. The central question to the institutional analysis is how institutions affect individual actions (Hall & Taylor, 1996). Both definitions introduced above (North, 1991; Scott, 2014) underline the importance of institutions to the social life and interaction among actors. The definition by Scott (2014) also

makes explicit that institutions provide stability. Hence, they are a source of resistance when attempting to change the "rules of the game".

One of the core concepts within the neo-institutional theory is *institutionalisation*, which may refer both to process and state that might change over time (Zucker, 1977; Colyvas, 2007). Institutionalisation is described through *objectivity* (an act can be reproduced without changing its meaning) and *exteriority* (different actors understand and interpret how things have to be done in the same way) (Zucker, 1977). In line with Zucker (1977), institutionalisation is not a state that the extremes may describe in terms of complete presence or absence, but rather it should be viewed as a continuum. Hence, actions can be institutionalised to a greater or lesser extent.

Researchers have also elaborated on mechanisms that drive the institutionalisation process. Meyer and Rowan (1977) and DiMaggio and Powell (1983) introduced *institutional isomorphism* as one of the core concepts, which implies convergence of organisational structures resulting from isomorphic pressures. DiMaggio and Powell (1983) distinguish among three sources of institutional isomorphism: coercive, mimetic, and normative. Coercive isomorphism stems from authority, power, dependence or centralised access to resources (DiMaggio & Powell, 1983). Mimetic isomorphism results from copying successful solutions, while normative isomorphism is an outcome of professionalisation when criteria and standards are established (DiMaggio & Powell, 1983). For isomorphic pressures to work, different types of actors play an essential role (Fuenfschilling & Binz, 2018). Thus, coercive pressures may be exercised through the actors with legislative power at a national, supranational or regional level, normative pressures come from the professional and standardisation related actors, while mimetic pressures stem from leading firms and experts (Fuenfschilling & Binz, 2018).

Neo-institutionalism, developed in the field of organisational theory, is rooted in the sociological perspective (Hall & Taylor, 1996). Therefore, it also underlines the importance of the social aspects for organisational behaviour. Accordingly, Meyer and Rowan (1977) introduced the concept of rationalised myths, which implies that formal organisational structures reflect relational social networks of an organisation, established to ensure the efficiency of work and mirror perceptions of society's reality. Rationalised myths denote social purposes as technical and define the means of how these purposes have to be achieved (Ellul, Wilkinson & Merton, 1964; Meyer & Rowan, 1977). Furthermore, rationalised myths are institutionalised, and organisations may comply with them, which results in *the decoupling* of organisational structures (Meyer & Rowan, 1977). Thus,

formal structure and practices within organisations deviate: structures across organisations become similar while practices are different (Meyer & Rowan, 1977). In the context of neo-institutionalism practices can be understood as "particular ways of conducting organisational functions" (Kostova, 1999, p. 309).

DiMagio and Powell (1987) introduced *the organisational field* as an analysis unit. Since then, the term *organisational field* denotes one of the key concepts in the neo-institutional theory, and its most simple definition might be "a constellation of actors that comprise […] central organising unit" (Wooten & Hoffman, 2017, p.56). The conceptualisation of a *field* also allows analysing connections and networks of organisations as a single unit, connecting them to macro structures, e.g., sectors or societies (Scott, 2014). Therefore, an organisational field constitutes an organisation's immediate environment, a source of isomorphic pressures. Organisational fields might emerge around specific issues relevant to a group of organisations (Hoffman, 1999). The field boundaries might be conceptualised based on the relevant unit of analysis, and an organisation can belong to multiple organisational fields (Scott, 2014).

Boxenbaum and Jonsson (2017) mentioned that organisations feel pressure from their environment to comply with institutions favouring isomorphism. However, these institutions do not necessarince an organisation's efficiency in achieving its purpose. They might reflect rationalised myths, as Meyer and Rowan (1977) described. Therefore, an organisation might formally adopt required institutions but behave differently (Boxenbaum & Jonsson, 2017). Consequently, institutional pressures might lead to decoupling instead of institutionalisation of expected behaviour.

1.2.2. Introduction to the research setting

Smart specialisation and *smart specialisation strategy* are the key terms associated with S3. The concept of *smart specialisation* emerged in the expert group, *the Knowledge for Growth,* appointed by the European Commission around 2009 (Foray, 2015). Foray (2015, p. 1) defines *smart specialisation* as "the capacity of an economic system (a region for example) to generate new specialities through the discovery of new domains of opportunity and the local concentration and agglomeration of resources and competences in these domains". But the term smart specialisation is not the same as the *smart specialisation strategy*, which according to Foray (2015) implies a coordinated governmental action aimed to enact "a process whereby such a dynamic of new speciality development, related to existing production structures, can be facilitated thanks to

punctual and targeted governmental intervention in order to support in a *preferential* way the most promising new activities in terms of discovery, experimentation, potential spillovers and structural changes." (Foray, 2015, p. 2). In the academic literature, both terms are often used interchangeably and abbreviated as *S3* (for: smart specialisation strategy), which implies the same as the formal abbreviation RIS3. Therefore, despite an inconsistent use of terminology, most smart specialisation literature refers to the RIS3. The current thesis adopts the abbreviation S3, which is dominant in academic sources. An exception to this is the expression *RIS3 Guide*, a commonly used reference for the *Guide to Research and Innovation Strategies for Smart Specialisation (RIS3)* (European Commission, 2012), outlining the European Commission's guidelines for S3.

Researchers note that the term *smart specialisation* might also be confusing due to the lack of a common understanding of the concept's nature (Komninos, Musyck & Reid, 2014). Thus, smart specialisation implies a combination of specialisation and diversification (McCann & Ortega-Argilés, 2013b; Cooke, 2016; Boschma & Gianelle, 2014). Consequently, the term *smart specialisation* may be deemed ambiguous, and its implications for the practice are not entirely clear.

The definition of the *entrepreneurial discovery process (EDP)* also provides room for interpretation and little guidance for practice. Accordingly, EDP is defined as "an inclusive and interactive bottom-up process in which participants from different environments (policy, business, academia, etc.) are discovering and producing information about potential new activities, identifying potential opportunities that emerge through this interaction, while policy-makers assess outcomes and ways to facilitate the realisation of this potential" (European Commission, n.d.-g, para. 1). As will be demonstrated within the theoretical background, understanding of what is participation may vary.

At the time of introducing S3, most comprehensive guidelines for the policy-makers have been summarised in the RIS3 Guide as the *six steps approach,* which includes (1) analysis of regional context, (2) governance, (3) developing a shared vision, (4) prioritisation, (5) creating policy mix, and (6) monitoring and evaluation (European Commission, 2012).

Despite its novelty, the concept of smart specialisation fits with recent tendencies in developing and implementing Research & Innovation policies. According to Grotenbreg and van Buuren (2016), they focus on the increasing importance of local policies, a bottom-up approach, and tighter collaboration between the public and private sectors. As Foray (2015) acknowledges, the smart

specialisation concept's theoretical foundations have still been lacking at the time of its practical application through innovation policy agendas.

Nevertheless, the concept may be rooted in systemic approaches to innovation that emerged at the beginning of the 1980s. These approaches argued that innovation is not a linear process but involves an interplay between different actors, including business organisations, intermediaries, government, and universities (Liu et al., 2015). It evolved into what is broadly known as the *innovation system* approach that developed some complementary concepts. In the extant literature, an *innovation system* is defined as "all-important economic, social, political, organisational, institutional, and other factors that influence the development, diffusion, and use of innovations" (Edquist, 2005, p. 182). Scholars distinguish among *national*, *regional*, *sectoral*, and *technical* innovation systems (Carlsson, 2006; Liu et al., 2015). These concepts transformed the discussion about innovation and innovation policy approaches in academia in the last decades. However, as Edquist (2019) notes, recent research has shown a gap between theoretical development and policy practice.

S3 responds to the call for differentiated and place-based policy solutions (Tödtling & Trippl, 2005). It is deemed suitable for the regions regarded as lagging (Barca, 2009). The definition of the lagging regions includes low growth regions "that did not converge to the EU average GDP per head at PPS between the years 2000 and 2013", and low income regions "with a GDP per head in PPS below 50% of the EU average in 2013" (European Commission, Directorate-General for Regional and Urban Policy, 2017, p. 4). These regions are also primary beneficiaries of ESIF (European Commission, n.d.-c). Lagging regions are also often characterised by lower innovation performance. They are classified as moderate (between 50% and 90% of EU level performance) or modest (under 50% of EU level) innovators as defined by the summary innovation index, developed for the European Innovation Scoreboard (see: European Commission, 2019, p. 13).

1.3. Identifying research gap

The pressure on the Member States emerged to develop their S3 quickly, resulting in researchers' growing interest in the topic. A scholarly discussion arose on possible challenges to implementing the concept, among which Morgan (2013) distinguishes the ones of conceptual, operational and political nature. However, given the novelty of the approach, empirical research related explicitly to S3 is still at its beginning. First articles that refer directly to smart specialisation were published around 2012-2013, and the number of yearly publications has been growing since then. Scoping

current literature on smart specialisation revealed several major streams that develop around the topic, with various specific themes within each of them. An overview of these streams provides Table 1.

Table 1 – Summary of research streams on smart specialisation

Research Stream	**Themes**
Situating smart specialisation as the research topic within academic literature	- new forms of policy and paradigm change - discussing the roots of smart specialisation and comparing it to complementary or similar concepts - grasping the sense of the concept and situating it within extant theories and approaches - smart specialisation and Triple Helix (or its subsequent generations)
Smart specialisation in practice	- governance and policy learning - scientific approaches to define and measure smart specialisation - tools for smart specialisation - policy evaluation
Smart specialisation in various context	- antecedents and drivers of smart specialisation - regional taxonomies and classifications - challenges for smart specialisation
Industrial reality and implications for smart specialisation	- related variety, technology branching and smart specialisation - key enabling technologies and smart specialisation - smart specialisation in the context of specific industries

Source: own elaboration

McCann and Ortega-Argilés (2013a; 2013b; 2016a) have written notable works on new policy-making forms and paradigm change. Other authors within this stream focused on the essence of the concept (Foray, 2014; 2018a). Several researchers discussed smart specialisation and its role within existing regional development theories (Benner, 2014) or its place within existing policy approaches (Foray, 2016a; Foray, 2018b). In the context of S3, attention also received concepts of related variety (van Oort, de Geus & Dogaru, 2015), relatedness and regional diversification (Balland et al., 2019), and technological diversification (Santoalha, 2019). An example of more complex modelling, including related variety, knowledge variety and networks, provides the study by Vermeulen and Pyka (2018).

Scholars have also brought up the *triple helix* model and subsequent generations of helices in the context of S3 (Carayannis & Rakhmatullin, 2014; Carayannis & Grigoroudis, 2016). The triple helix model implies a central role of universities in the collaborative innovation process based upon relations between university, government, and industry, representing the three helices (Etzkowitz & Leydesdorff, 2000). In this aspect, it differs from the firms-centred innovation system approach.

The quadruple helix model also considers media-based and culture-based public (Carayannis & Campbell, 2009, p. 206). The quintuple helix adds the context of the natural environment and ecology (Carayannis, Barth & Campbell, 2012). Because of its university-centred approach, the helix model receives little attention in this thesis. However, it might be helpful to adopt its terminology and refer to the relevant stakeholder groups as respective helices in the S3 process. Hence, researchers also refer to the *triple helix coalition* as a salient assumption of S3 (Marques & Morgan, 2018), which implies that actors from government, industry and academic sectors work together towards a common goal.

Another literature stream focuses on the themes that could be summarised under "how and under what circumstances smart specialisation does or does not work". This research is also diverse in terms of the issues, geography, and aspects covered. It includes research on antecedents and drivers of smart specialisation and distinguishes between business-structure-related and institutions-related factors. For instance, differences in governance capabilities, combined with various industrial structures and the supply of skills in different regions, might determine the strategy and its outcomes (McCann & Ortega-Argilés, 2014). Specifically, scholars discussed implications for S3 in connection to changing nature of innovation networks in Scandinavia (Ylinenpää, Teräs & Örtqvist, 2016), development of competitiveness clusters in Croatia (Anić et al., 2019) or path dependence issues due to characteristics of knowledge space in Ireland (Whittle, 2019; Whittle 2020).

Scholars have also developed taxonomies of regions according to characteristics that might be relevant for the S3 approach. Researchers proposed taxonomies according to the regional smart growth level (measured as the composite of indicators for smart specialisation), based on the workforce structure (Sobczak, 2012), or creativity and innovation (Markowska & Strahl, 2012). Regions have also been classified according to their modes of innovation (Camagni, Capello & Lenzi, 2014), innovative performance models (Lopes et al., 2018a), or possible sources of comparative advantage, such as key enabling technologies (Ciffolilli & Muscio, 2018), and clusters (Lehmann & Jungwirth, 2019). Researchers distinguish 19 types of regions across the EU based on socio-economic and demographic characteristics (Pagliacci et al., 2020).

Therefore, research on smart specialisation is diverse, despite its novelty. There is also much fragmentation – scholars discuss numerous aspects and issues separately, while elaboration on the links between different themes is insufficient. Consequently, it is challenging to recognise a coherent and uniform theory emerging from the proliferation of different topics. As for now,

probably the most elaborated research stream links S3 to the industry context and knowledge spill-overs between sectors, and particularly the concept of "related variety" (Frenken, Van Oort & Verburg, 2007; Boschma & Iammarino, 2009). On the other hand, empirical evidence on the current outcomes of S3 is still not sufficient (Kroll, 2019a). The research, aiming to assess what the S3 approach implies for innovation policy in different regional settings and whether it might trigger necessary change towards convergence of theory and practice, is scarce. Reporting the approaches across regions is primarily descriptive.

In this context, the neo-institutional theory might provide a valuable perspective to understand better the dynamics behind change and stability. The notion that institutional context matters is embedded in the innovation systems and S3 approach. However, neo-institutional theory with its various concepts explaining change has rarely been adopted in S3 research. While the current research project was ongoing, no empirical studies on smart specialisation adopting the neo-institutional theory perspective have been identified during systematic scoping of the emerging literature on smart specialisation in the Scopus and Web of Science databases. Only very recently, a couple of relevant studies emerged. Thus, Benner (2019) adopted the view of the institutional context across regions and analysed how EDP may function as a framework that may either maintain current institutions or introduce change. His study covered cases of Lower Austria, South Tyrol, Slovenia, and Croatia. Henderson (2020) adopted an institutional work perspective to study the maintenance of regional policy instruments in Wales over ten years.

This study will take a closer look at two particular countries: Poland and Lithuania. Both countries belong to moderate innovators. Therefore, they are among the regions assumed to need support foremost. The study aims to address the gap between diverging theory and policy practice and find out whether the S3 approach may put change processes in place and whether this change may become sustainable. Neo-institutional theory serves as a lens to analyse the process. The research takes a qualitative approach and aims to explore the processes, which led to the emergence of the official documents called smart specialisation strategy in Poland and Lithuania during the preparation phase for the financial programming perspective 2014-2020 and the initial implementation phase. It also goes a step further and aims to explain why the process delivered the results as they currently are. More precisely, the research focuses on adopting novel innovation policy-making practices in Poland and Lithuania. A broader theoretical perspective for the research serves structuration theory, developed by Giddens (1984). Structuration theory acknowledges the existence of the real structural properties of the societies on the one hand, but, on the other hand, it

admits that the structure exists solely as the result of activities of human agents (Kessler, 2013, p. 807). Thus, it complements the neo-institutional theory perspective.

1.2. Purpose of the dissertation and research questions

Working thesis

The official documents of Lithuania and Poland called *smart specialisation strategy* do not reflect genuine prioritisation. Consequently, these documents did not result in the consolidation of public support for R&I during the ESIF programming period 2014-2020 in the mentioned countries, despite the initial expectations of the European Commission.

Research purpose

The purpose of the research is to explore the process of defining and implementing smart specialisation strategies in Lithuania and Poland and explain possible reasons for inconsistencies in the implementation with the guidelines defined by the European Commission in these countries.

Research problem

What are the antecedents and reasons for the policy documents labelled as smart specialisation strategies not leading to genuine prioritisation and not ensuring the possibility to consolidate public support for research and innovation (R&I) during the financial programming period 2014-2020 in Poland and Lithuania?

Research questions

The following research questions (RQs) aim to explore the S3 in Lithuania and Poland and explain the outcomes of isomorphic pressures:

RQ1. How did the preparation of the official S3 documents evolve in Poland and Lithuania, including the implementation of the Entrepreneurial Discovery Processes (EDP)?

RQ2. How did both countries progress from the S3 planning to the implementation stage?

RQ3. What characterised the relationship of different stakeholders to the smart specialisation development process, and how the relationship evolved?

RQ4. Have the *coercive isomorphic pressures* of the European Commission (which required the development of S3 by EDP) resulted in the successful and persistent institutionalisation of this new approach to R&I policies?

RQ5. Have there been *mimetic isomorphic pressures* among regions within the same country (Poland)[1] related to the development of S3 by EDP, which resulted in the successful and persistent institutionalisation of this new approach to R&I policies?

RQ6. Have there been *mimetic isomorphic pressures* among EU member states related to the development of S3 by EDP, which resulted in successful and persistent institutionalisation of this new approach to R&I policies?

RQ7. Have there been *normative isomorphic pressures* on EU regions or member states related to the development of S3 by EDP, which resulted in the successful and persistent institutionalisation of this new approach to R&I policies?

RQ8. Has the S3 & EDP approach been institutionalised in Lithuania and Poland, or can decoupling be observed, with a divergence of political declarations and actual implementation?

Embeddedness in literature

Studying institutionalisation calls for the appropriate consideration of the institutional context in the analysed countries and regions. Therefore, to answer the research questions comprehensively and avoid misinterpretation of the results, the current thesis also addresses S3 issues from the perspective of its external environment (other European regions) and immediate environment in Lithuania and Poland (national context). The systematic literature review on smart specialisation should bridge the theoretical and empirical parts of the study. More specifically, it also seeks to identify the factors that have affected the perceived success or failure of EDP in European regions through answering the following literature questions (LQs):

LQ1. What factors might affect the S3 context and approach to EDP in European regions?

LQ2. What challenges for the S3 approach exist in different types of regional innovation systems?

LQ3. What effects has the S3 approach had on developing and implementing the R&I policies in European regions?

LQ4. What characterised S3 and EDP in Poland and Lithuania, concerning six steps approach and thematic issues, distinguished in the RIS3 Guide?

The systematic literature review belongs to the theoretical part of the thesis.

1 This research question refers only to Poland, because Lithuania did not develop regional S3 documents, but only one, nation-wide strategy, while the analysis of Poland allows the researcher to track the diversity of regional approaches to S3 and EDP.

1.4. Contribution to the field of management and organisation studies

As noted earlier, the S3 approach reflects the general development within innovation policy, emphasising collective and participative solutions. Thus, the study relates to the field of management and organisation theory in two aspects. First, the concept of smart specialisation fits with thinking of innovation within the framework of innovation systems. This framework abandons the linear view of innovation and sees innovations as an outcome of interaction among different participants within an innovation system, as indicated in the definition of systemic approaches to innovation by Isaksen, Martin and Trippl (2018). It puts the study in the light of evolving approaches to innovation, which is covered by the scope of innovation management and its recent focus on collaborative innovation making. Second, an *ex-ante* conditionality to develop S3 imposed change on the EU member states in their innovation policy-making traditions, which may cause resistance. Hence, implementing and sustaining change while dealing with resistance could contribute to the acceptance and subsequent success of S3. Current research would contribute to the theoretical body on change studies concerning its implementation and governance on a large scale, such, as the region, from the neo-institutional theory perspective.

The research draws upon theoretical contributions from the field of management and organisational theory, namely the innovation system approach, the literature on change and neo-institutional theory. Central to this study is the concept of *institutionalisation*. It has already been studied in different settings, such as commercialisation of science (Colyvas & Powell, 2006), technology transfer (Colyvas, 2007), or corporate social responsibility reporting (Shabana, Buchholtz & Carroll, 2017), to name just a few. It has also been applied to tackle the issues of transplanting certain practices or models into different cultural settings within multinational corporations (Kostova, 1999) or at the national level (Caramanis, Dedoulis & Leventis, 2015). Recent suggestions are to select institutionalisation as a perspective for studying digital innovation and transformation (Hinings, Gegenhuber & Greenwood, 2018). The current study aims to contribute to this broad stream of research by exploring the links between isomorphism and decoupling in the institutionalisation process, answering the call of Boxenbaum and Jonsson (2017).

1.5. Thesis outline

Chapters two and ***three*** include the literature review. Given the novelty of smart specialisation as a research topic and the complexity of the research problem, the literature review draws upon different theoretical concepts that may be deemed relevant in the research context. The review introduces the theoretical perspective adopted in this study, which is the neo-institutional theory. It also provides an overview of the theoretical assumptions underlying S3.

Chapter two summarises the theoretical stance of neo-institutional theory, focusing on the issues and concepts relevant to the thesis. Particular attention is given to the research on institutionalisation. The review focuses on both aspects, noted by Meyer and Rowan (1977): similarity of structures and difference of practices. Accordingly, in line with the theory of structuration (Giddens, 1984), the review considers the influence of present institutions on the organisational responses to the newly emerging institutional pressures and actions taken to shape these institutions and respective structures. Thus, the review also includes several concepts from the fashion theory, which address these issues and enhance explanatory value.

Furthermore, the chapter presents an overview of the research on innovation policy. It illuminates the evolution of the rationales behind public support to innovation in the light of neo-institutional theory. Furthermore, it addresses the research on innovation systems and their implications for S3. The chapter also discusses the literature on collaborative governance, participative approaches and reflects various possible interpretations of S3 assumptions. The chapter also considers the implications of these diverse research streams for the emerging organisational field around innovation policy, building ground for S3.

Chapter three provides an overview of the research context, which is S3. It aims to provide an overview of the S3 guidelines and approaches to S3 across the EU and set Lithuania and Poland in the context. First, the chapter introduces S3 steps that regions have to follow, based on the guidelines provided by the European Commission. Second, the chapter addresses the international S3 context and discusses similarities and differences in approaching the S3 exercise, challenges and provides an outlook for possible effects of the S3. Third, it provides a comparative overview of the national S3 context in Lithuania and Poland. The chapter should serve as a contextual background and benchmark information to the cases of Poland and Lithuania.

The ***fourth chapter*** describes the research method and techniques used in the study. Chapters ***five*** presents research findings based on analyses of interviews and documents. It presents the research results from the cases of Poland and Lithuania and distinguishes elements and mechanisms that might describe the institutionalisation of S3. ***Chapter six*** discusses results in light of existing theory. The chapter concludes with an empirically rooted model that might be used to analyse S3 and EDP and better understand the outcomes of isomorphic pressures.

The concluding ***chapter seven*** sums up the main findings and presents theoretical and practical implications of the study.

2. Theoretical background

The chapter introduces the neo-institutional theory as a theoretical perspective adopted in this study. It also provides an overview of the theoretical assumptions underlying S3 as an R&I policy tool, drawing on various relevant concepts for the research topic.

First, the chapter covers the literature on institutionalisation and related concepts because the research is grounded in the neo-institutional theory perspective and, more precisely, explores whether the S3 approach has been institutionalised in Lithuania and Poland or represents merely a hype. The chapter addresses key concepts, such as *institutionalisation*, *institutional work*, *isomorphism*, *isomorphic pressures* and *decoupling*. Another relevant stream of research that complements the literature on institutionalisation is *fashion theory*, a perspective that reflects the dissemination of new ideas. Thus, the term *fashion* has also been searched in literature. A review of neo-institutional theory covers two perspectives. It focuses on the diffusion of new ideas and mechanisms, leading to structural similarity, and considers responses on the actors' side and their role in institutionalisation. Therefore, with accounting for this duality and interplay between actors and institutions this thesis relates to the structuration theory, developed by Giddens (1984). The thesis focuses on the circumstances under which actors comply with institutional pressures or decouple. An in-depth analysis of decoupling strategies is beyond the scope of this review.

Second, the chapter summarises relevant research on innovation and innovation policy. Knowing what characteristics might define S3 is essential to determine whether it is institutionalised according to the initial assumptions. As noted earlier, the definitions of relevant concepts in S3 lack precision, making it difficult to determine when they might be considered institutionalised. Therefore, the literature search included more widely elaborated concepts that serve as a theoretical background for the S3 approach. For *smart specialisation*, this includes the *innovation system* approach and its variations. An overview of the literature on innovation systems outlines the critical dimensions of S3 related to geographic (place) and technology (industries) aspects. Even though S3 is a place-based approach, the underlying technology and industry aspects have important implications for the prioritisation process and discoveries of new specialisations based on *related variety*. A critical aspect of S3 is EDP. For EDP, search terms included *participation*, *participative policy-making*, *collaborative governance*, and *deliberation*. Reviewing these concepts reveals a spectrum of potential approaches concerning the government and other stakeholders' roles in organising for S3.

2.1. Neo-institutional theory as a perspective on change

This subchapter discusses the theoretical perspective adopted in this study. First, the subchapter positions neo-institutionalism as a perspective on change and explains why it has been chosen from other possible theoretical perspectives. Second, it elaborates on the concepts of *institutionalisation*, *isomorphism*, and *decoupling*, which are key to neo-institutionalism and are explicit in the research questions. The subchapter also illuminates the relationship between them. It also introduces the stream within the neo-institutional theory, which focuses on what actors do in response to the institutional pressures, known as a perspective of *institutional work*. Covering this perspective sheds some light on the possible explanations of the specific organisational responses to the institutional pressures. Besides, the review addresses such concepts as *legitimacy, power, organisational field,* and *institutional logic*. These concepts are handy for explaining institutionalisation in multi-actor and multi-level settings, such as S3.

The subchapter comprises three sections. The first section aims to position neo-institutional theory as a perspective on change. The second section introduces the key concepts that explain the change from the neo-institutional theory perspective. The third section discusses key concepts related to the forces fostering stability and change in the organisational fields, constituting precondition for institutionalisation.

2.1.1. Neo-institutional theory and alternative approaches

There is an abundance of different approaches to change, and their overview is not within the scope of this thesis. However, in the context of S3, it might be helpful to understand the demarcation between the top-down versus bottom-up dimension. An overview of the prevalent schools of thought within the literature on change may also enhance understanding of S3 and EDP concepts' logic, considering different approaches.

Van de Ven and Poole (1995) suggested an overarching framework, capturing various proposed approaches to change and organisational development and a typology of those theories based on the background of their intellectual tradition. They distinguished among four leading schools of thought and argued that *process-focused* change theories match at least one of them. Van de Ven and Poole (1995) label them "motors of change" and differentiate according to their mode of change (*prescribed* or *constructive*) and focus on a single unit or interaction among them. The framework

allows for the analysis of change processes from different perspectives. The mentioned schools are (Van de Ven & Poole, 1995, p. 511):

1. *Life-cycle* (focus on prescribed mode for a single unit);
2. *Teleological* (operates constructively and focuses on a single unit);
3. *Dialectical* (focus on the constructive process, involving multiple entities);
4. E*volutionary* (prescribed but involves multiple entities).

According to Van de Ven and Poole (1995), the four theories can be rarely recognised in their pure form. Instead, the interplay among them results in twelve additional variations, explaining the change in particular circumstances. Implementing one approach may trigger a subsequent change that follows a different model, implying that different approaches may be employed simultaneously and sequentially (Van de Ven & Sun, 2011).

The neo-institutional theory allows conceptualising the change process as an interplay between forces that foster either stability or change. Therefore, it enables an elaborated analysis, considering multiple modes of change. Such flexibility and universality have their roots in the different research streams, which affect this theoretical perspective. The term *new institutionalism* may denote three distinct views: historical, rational choice, and sociological institutionalism, which later developed in organisation theory (Hall & Taylor, 1996).

The sociological institutionalism perspective emphasises a cultural aspect of organisational practices and argues that organisations adopt certain practices not necessarily because of rational choice and efficiency but because they are akin to the myths and ceremonies circulating within societies (Hall & Taylor, 1996). Given such a perspective, an explanation that organisations adopt specific solutions (e.g., procedures, practices, approaches) for efficiency reasons is insufficient. Thus, much of the scholarship within neo-institutionalism has been concerned with the diffusion of practices or structures (Hall & Taylor, 1996). Therefore, neo-institutionalism might connect to diffusion literature, particularly the diffusion of innovations (Rogers, 1976). It might be helpful to think about newly introduced organisational practices as organisational innovations. However, organisational innovations, e.g., management concepts, lack a material component (Benders & Van Veen, 2001), limiting the explanatory power of the diffusion perspective concerning such innovations. Because these diffuse through discourse (Abrahamson & Fairchild, 1999), users might feedback into that discourse and change the concept's initial meaning (Benders & Van Veen, 2001).

In contrast to the widespread assumption that organisations have clear goals and can choose the most appropriate means to attain them, this may not always be true (Abrahamson, 1996). Therefore, Abrahamson (1991) draws upon neo-institutional theory, mainly the work of Meyer and Rowan, and suggests that management techniques denote both desirable goals and the means to achieve them. Hence, not all management innovations are beneficial since inefficient or harmful management innovations also diffuse, and organisations adopt them (Abrahamson, 1991). Therefore, *fashion* provides a more sensible perspective concerning innovative management techniques than diffusion (Abrahamson, 1991; 1996). *Management fashion* represents a temporary collective belief propagated by fashion setters that a particular technique leads to rational progress in management (Abrahamson, 1996). The fashion-setting is then "the process by which management fashion setters continuously re-define both theirs and fashion followers' collective beliefs about which management techniques lead rational management progress" (Abrahamson, 1996, p. 257). Abrahamson (1991) also proposes that rational perspectives may explain diffusion at the early stages but not later, and fad and fashion perspectives have higher explanatory power at these stages.

In Abrahamson's (1996) view, demand for management fashion results from organisational performance gaps, emergent from contradictions within organisations and changes in the external environment. Conversely, fashion setters put attention to the emergent gaps and propose techniques to fill them. Thus, fad and fashion perspectives also complement the neo-institutional theory as they recognise imitation as the antecedent to the organisational choices, which might also help to explain the effects of the mimetic isomorphic pressures.

Given the discussion above, neither the diffusion perspective nor the fashion theory alone can provide an elaborated explanation for the different outcomes organisations might achieve when adopting the same organisational innovation. It might be because of the little attention that both perspectives pay to the recipients of these innovations, with the implicit assumption of their relatively passive role. In this respect, neo-institutional theory focusing on organisational responses to pressures and recent development in institutional work perspective explicitly acknowledges the importance of actors. For these reasons, it has been chosen as the leading theoretical perspective for this study.

2.1.2. Key concepts in neo-institutionalism

The section introduces the key concepts that explain the change from the neo-institutional theory perspective. Firstly, the concept of *institutionalisation* is pivotal in understanding how the new ideas might be adopted and become organisational routines. Therefore, the section explains the difference between institutionalisation as outcome and process. It discusses stages of institutionalisation, measurement indicators, and how institutions spread through time and space. Secondly, it introduces the concept of *legitimacy*, which is crucial to organisational survival. An organisation might introduce change if this is necessary to gain or maintain legitimacy. Legitimacy also connects to organisational status and reputation, representing other types of social evaluation (Deephouse & Suchman, 2008). In this context, the concept of *organisational façades* is relevant because it allows organisations to maintain their reputation and enhance legitimacy while enabling gradual change and learning by trial and error. Finally, the notion of the *organisational field* defines the boundaries between the organisation's immediate and external environment. Isomorphic pressures stem from the field, and organisations might comply with them or choose to decouple their practices from structures. However, organisations might also act to structure fields and change "rules of the game". Therefore, understanding the concept of the organisational field is essential to interpret the forces that affect an organisation and pressure it towards stability or change.

2.1.2.1. Institutionalisation

Zucker (1977) describes institutionalisation both as a transmission process of the social definition of reality, as well as a property, which is the taken-for-granted meaning of an act in a given point of time. It has been nicely captured by Colyvas (2007, p. 458) when she states that:

> *"Viewed processually, institutionalisation represents the manner of attaining an order that, in turn, reproduces itself. As an outcome, it represents the state of having realised this order, and is then reinforced through feedback mechanisms that shape and govern behavior."*

The current subsection discusses both views. Firstly, it covers the issues related to institutionalisation as an outcome or state of the art. It discusses different stages and reviews indicators, which might be used to determine the degree of institutionalisation. Secondly, it discusses the process of institutionalisation, focusing on two perspectives: the driving pressures from the environment and feedback mechanisms that might determine the outcome of the process. In this context, the subsection also introduces concepts of organisational field, institutional logic,

legitimacy, and power, which are crucial to understanding how different forces might influence the balance between institutional stability and change.

2.1.2.1.1. Institutionalisation as an outcome

As an outcome, institutionalisation may be interpreted as the level of *objectivity* and *exteriority* that the rules under consideration have reached (Zucker, 1977), which implies that the more the rules get institutionalised, the more they become a routine. Scholars have distinguished between *adoption* and *entrenchment* stages of institutionalisation and argued that only entrenched practices would produce enduring change, while those merely adopted may be abandoned quickly (Zeitz, Mittal & McAulay, 1999). Kostova (1999) conceptualised institutionalisation at two different levels: *implementation* and *internalisation*. Implementation occurs when practices are formally adopted and followed. Internalisation implies that employees perceive practices as meaningful and use them with the belief that they add value to the organisation. Implementation is also a necessary condition for internalisation.

Other scholars refer to the practices, which have not yet reached the entrenchment stage and are at the early stage of institutionalisation, as *proto-institutions* (Lawrence, Hardy & Phillips, 2002; Hensel, 2018). Thus, institutions are practices, rules or technologies that are highly diffused and entrenched, and it is too costly to replace them with other practices (Lawrence, Hardy & Phillips, 2002). Proto-institutions refer to the practices at the initial stage of institutionalisation, but their progress is uncertain (Hensel, 2018). Table 2 summarises different conceptualisations of institutionalisation stages.

Table 2 – Stages of Institutionalisation

Conceptualisations	**Sample studies**
adoption (low degree of institutionalisation) and *entrenchment* (fully institutionalised)	Zeitz, Mittal & McAulay, 1999
implementation (practices formally adopted) and *internalisation* (practices perceived as meaningful)	Kostova, 1999
Proto-institutions (practices at the early stage of institutionalisation)	Lawrence, Hardy & Phillips, 2002; Hensel, 2018

Source: own elaboration

Researchers have also developed indicators of institutionalisation. Zeitz, Mittal and McAulay (1999) distinguished five bases determining whether practices will be entrenched or just adopted (Zeitz, Mittal & McAulay, 1999, p. 741):

1. *Modelling* refers to the imitation of practices and focuses mainly on adoption.
2. *Culture* stems from values and beliefs mirrored in cognitive and normative inclinations of actors and aims at entrenchment.
3. *Education* enables communication of values and beliefs by designated means and fosters entrenchment.
4. *Regulation* puts constraints on some actors that may use positive motivation or sanctions for non-compliance. Hence, it may evoke both adoption and entrenchment.
5. *Technical rationality* refers to measuring and evaluating responsiveness to needs and contributing to performance, and it aims to enact both adoption and entrenchment.

Whether practice then will be merely adopted or entrenched depends upon (Zeitz, Mittal & McAulay, 1999):

1. Presence of *different bases*;
2. *Compatibility* of the practice with other practices;
3. *Formalisation* level;
4. *Depth* of embeddedness within a cognitive structure and implicitness;
5. *Systemic coherence* and articulation;
6. *Interdependencies* and well-established connections between different bases.

2.1.2.1.2. Institutionalisation as a process

The evolutionary perspective on change is highly influential in the processual view of institutionalisation. It also explains the institutionalisation of fashionable management techniques. Thus, new discourse for a management technique emerges at the variation stage and diffuses rapidly during the selection stage (Abrahamson & Fairchild, 1999). It might be described as "travel" of ideas (Czarniawska & Joerges, 1996; Czarniawska-Joerges & Sevón, 2005). The retention stage indicates institutionalisation of promoted practices - if it fails, fashions are rejected. The variation-selection-rejection cycle is normality, while variation-selection-retention is an exception (Abrahamson & Fairchild, 1999; Zucker, 1977).

Recently, researchers in the processual view of institutionalisation also adopted such conceptualisation. A notable example is set by Vargo, Wieland and Akaka (2015) study, assuming that ongoing maintenance, disruption, and change of institutions drive innovation, resulting in new technological solutions to markets. Therefore, studies of institutionalisation and fashion theory draw upon an evolutionary perspective on change, corresponding to the evolutionary motor of change

described by Van de Ven and Poole (1995). As follows from the discussion above, the institutionalisation of management concepts relates to discourse, leading to retention or rejection. According to Abrahamson and Fairchild (1999), discourse varies across distinct fashion life cycle stages. Discourse ambiguity at the variation stage might affect institutionalisation progress: in the case of proto-institutions, the definition of what is conforming might lack precision, and actors may receive conflicting accounts from different sources, impeding institutionalisation (Hensel, 2018).

The lack of precision is vital to newly introduced management techniques. Thus, according to Benders and Van Veen (2001), the core characteristic of fashionable concepts is *interpretative viability* (they note that the term that has been introduced in the work of Günther Ortmann *"Formen der Produktion: Organisation und Rekursivität"*, published in 1995). *Interpretative viability* stems from the lacking material component of innovative management concepts compared to innovative products (Benders & Van Veen, 2001). It implies that concepts are slightly ambiguous. Such ambiguity allows for alternative interpretations and projection of the concept as a solution to the problems of the own organisation, which helps to enhance the popularity of the concept and its diffusion to the new markets (Kieser, 1997; Benders & Van Veen, 2001). Hence, *interpretative viability* allows using popular concepts as labels for change that do not necessarily reflect the core ideas of the concept's creator (Benders & Van Veen, 2001). Then, studying management fashions involves: "the patterns of production and consumption of temporarily intensive management discourse, and the organisational changes induced by and associated with this discourse" (Benders & Van Veen, 2001, p. 40). Specific uses may feedback into the discourse, which determines the change in organisations (Benders & Van Veen, 2001). These insights from the fashion theory might explain why some ideas do not get institutionalised: the feedback from adopters might substantially change the core idea.

While one stream of fashion research emphasises their short-liveness and replacement by other concepts, another part concentrates on *sedimentation* and the long-time impact that formerly fashionable ideas have on organisational practices (Heusinkveld & Benders, 2012). *Sedimentation* refers to the institutionalisation of practices that vary, and it links to (Heusinkveld & Benders, 2012):

- *Discourse* (language used, or terms intentionally avoided);
- *Formal control systems* (adapted formal work routines or methodological approaches to problem-solving);
- *Ideologies* (inherited specific mindset and accumulated learning through enactment).

The three sediments, as mentioned above, may also follow either parallel or separated evolutionary trajectories.

2.1.2.2. Legitimacy

Colyvas and Powell (2006) suggest self-reinforcing *legitimacy* and enhanced *taken-for-grantedness* as antecedents to institutionalisation. “Legitimacy is a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definition” (Suchman, 1995, p. 574). In Suchman’s view*, generalised* means that even if some actions deviate from the considered norm, this does not alter legitimacy if the history of what is happening is consistent otherwise. Then, the *taken-for-grantedness* may be measured as “the extent to which practices become embedded in organisational routines and become largely unquestioned” (Colyvas & Powell, 2006, p. 311). Legitimacy has been extensively researched and widely discussed in the context of institutionalisation. In comparison, *taken-for-grantedness* has received much less attention, even though the concept is explicitly mentioned in the definition of institutionalisation.

Suchman’s (1995) definition of legitimacy, presented above, is the most cited in the literature (Deephouse et al., 2017). However, recently scholars proposed a revised definition, according to which “organisational legitimacy is the perceived appropriateness of an organisation to a social system in terms of rules, values, norms, and definitions” (Deephouse et al., 2017, p. 32). Notably, the definitions connect legitimacy to the *social* or *socially constructed* systems, which is a central aspect, distinguishing neo-institutionalism from the theories based on rationality as the primary explanation for organisational choices. The social aspect also connects legitimacy to the *rationalised myths* introduced by Meyer and Rowan (1977).

Legitimacy may vary in its forms and states. The distinction between pragmatic, moral and cognitive forms of legitimacy has been drawn (Suchman, 1995). Researchers noted that establishing legitimacy may also be relevant at the internal level of an organisation, e.g., between parent and subsidiary in multinational companies (Kostova, 1999). Deephouse et al. (2017) also distinguish four states of organisational legitimacy: *accepted, proper, debated,* and *illegitimate. Accepted* reflects the highest degree of legitimacy and implies that an organisation is perceived as legitimate without being actively evaluated. *Illegitimate* means that an organisation is perceived as

inappropriate, according to accepted norms, and it should be reformed. Thus, an organisation might introduce changes to enhance its legitimacy.

Organisations strive to account for legitimacy in the eyes of the stakeholders upon whose resources they depend by demonstrating that they are efficient and effective and may evoke such perceptions by rising *façades* (Abrahamson & Baumard, 2008). Abrahamson and Baumard (2008) note that façades are emergent, and organisations work on them continuously. Moreover, they are multifaceted and serve different purposes. Thus, *rational façades* demonstrate that rational means are used to achieve specified ends, and *progressive façades* show that the newest and most progressive solution is employed (Abrahamson & Baumard, 2008). Hence, a façade helps appear consistent in front of the stakeholders and "hides the trial and errors inevitable in bringing about change" (Abrahamson & Baumard, 2008, p. 445).

Summing up the insights of Abrahamson and Baumard (2008), *progressive façades* may enable doing the same thing. Even if sometimes relabelled, they may have a symbolical role and create an impression of being progressive. However, they also may be means to introduce and legitimise an already existent deviant innovation that otherwise would not be accepted by stakeholders. Besides, progressive façades may enable innovation that otherwise would not come through because of intense micro-management, imposing pressure to make early choices. Hence, progressive façades allow for an ex-post convergence of experiments and their outcome (Abrahamson & Baumard, 2008).

A *reputation façade* aims to create an impression that an organisation beneficially serves its stakeholders, demonstrating it with symbols and rhetoric (Abrahamson & Baumard, 2008). On the one side, the reputation façade causes stakeholders to believe that an organisation can achieve more than it is capable of. On the other side, it plays a role of a self-fulfilling prophecy as organisations work to reduce the gap between reality and reputation façade, which may encourage more risky decisions and radical innovation (Abrahamson & Baumard, 2008). Notwithstanding, organisational façades may also serve as a protecting shield and enable illegitimate actions (Abrahamson & Baumard, 2008). Abrahamson and Baumard (2008) conclude that the more façades lie, the higher their potential for transforming the reality closer to the visible picture, otherwise stakeholders can look through the façades and delegitimise such an organisation.

2.1.2.3. Organisational field

The term *organisational field* denotes one of the key concepts in the neo-institutional theory, and its most simple definition might be "a constellation of actors that comprise […] central organising unit" (Wooten & Hoffman, 2017, p.56). The core ideas of an organisational field have been introduced already in the early writings on neo-institutionalism (Meyer & Rowan, 1977; DiMaggio & Powell, 1983), where it served as a unit of analysis. Thus, the field boundaries might be conceptualised based on the relevant unit of analysis, and an organisation might belong to multiple organisational fields (Scott, 2014). Organisational fields might emerge around specific issues relevant to a group of organisations (Hoffman, 1999).

The field concept in neo-institutionalism emerged from the need to conceptualise relevant organisational environment (Scott, 2014) and acknowledge the dimension of *structure*, reflecting the influence that structuration theory had on neo-institutionalism (DiMaggio & Powell, 1983). In the early writings, the organisational field was conceptualised as "those organisations that, in the aggregate, constitute a recognised area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organisations that produce similar services or product" (DiMaggio & Powell, 1983, p. 148). The conceptualisation of a *field* also allows analysing connections and networks of organisations as a single unit, linking them to macro structures, e.g., sectors or societies (Scott, 2014). Table 3 clarifies the position of the field regarding other levels of analysis.

Table 3 – Positioning institutional field as an analysis level

Level of analysis	**Explanation**
The world system	Might refer to "global", "international" or "transnational" societal processes or structures;
The society	Structures and processes at the national level;
Organisational field	A collection of organisations, active in a common meaning system;
Organisational populations	A collection of organisations that are perceived as homogenous or alike (e.g., trade unions, newspaper companies);
Organisation	Considers specific organisation;
Organisational subsystem	Units, comprising an organisation (e.g., departments);

Source: own elaboration, based on Scott, 2014, pp. 105-107.

2.1.2.4. Isomorphism and decoupling

Researchers have also further refined the notion of *conformity* to societal expectations, which Meyer and Rowan (1977) mentioned. Conformity might refer to *compliance* and *convergence* that may not necessarily go hand in hand (Ashworth, Boyne & Delbridge, 2007). Compliance means "moving in the direction, consistent with isomorphic pressures", while convergence denotes the "extent to which all organisations in the field resemble each other more closely over time" (Ashworth, Boyne & Delbridge, 2007, p. 169). Extant research suggests that interpreting conformity as compliance strengthens isomorphic pressures, especially on culture and strategy content (Ashworth, Boyne & Delbridge, 2007). Ashworth, Boyne and Delbridge (2007) explain this by suggesting that people might give more congruent accounts for strategy and culture, while structures and processes are too obvious to mislead.

Thus, isomorphism stems from organisational compliance with rationalised myths that become institutionalised and diffuse, which may cause two problems to organisations (Boxenbaum & Jonsson, 2017). First, these do not necessarily represent an efficient solution. Second, several inconsistent rationalised myths might exist, and organisations need to adhere to them. Therefore, organisations decouple officially adopted structure from practice (Meyer & Rowan, 1977; Boxenbaum & Jonsson, 2017).

Decoupling may happen when a favourable interplay of different factors occurs and interests vary (Westphal & Zajac, 2001). In the study, conducted by Westphal and Zajac (2001), CEOs were likely to decouple declared policies from practice if the following conditions for CEOs were met: (1) higher relative power compared to the board, (2) a positive experience with decoupling in a similar context or (3) maintaining ties with other firms in the network that had experience with decoupling, which enhanced vicarious learning. *Vicarious learning* means that organisations learn not by experiencing the consequences directly but by observing others and modelling their behaviour (Manz & Sims, 1981). However, the problem is that the sample available for observation is biased towards most successful organisations, meaning that practices that do not lead to success in the general population of organisations are visible and can be learned (Denrell, 2003).

Thus, decoupling is a form of organisational response to conflicting or harmful demands for adaptation (Boxenbaum & Jonsson, 2017). Using decoupling may be selective, serving political interests (Westphal & Zajac, 2001). As Boxenbaum and Jonsson (2017, p. 81) put it: "by

decoupling, organisations achieve legitimacy through espoused action but remain efficient or consistent through actual action, which enhances their survival prospects." Therefore, an important implication is that an organisation can decouple if it enjoys a high degree of legitimacy because otherwise, it would be subject to inspection (Boxenbaum & Jonsson, 2017). In this context, building *organisational façades* (Abrahamson & Baumard, 2008) could be an important tool that might help an organisation maintain its legitimacy and favour decoupling. Organisations can also manage conflicting demands by *counter-coupling*, which does not imply decoupling in the sense of institutional theory but means that decisions and actions are loosely coupled (Cho, Laine, Roberts & Rodrigue, 2015). It allows managers to substitute, e.g., actions by the talk to pacify critical stakeholders while concentrating the talk-inconsistent actions towards other stakeholders (Cho et al., 2015). Cho et al. (2015) noted that counter-coupling enables organised hypocrisy, which helps an organisation manage conflicting stakeholder demands and preserve its legitimacy.

Institutionalised ideas shape a socially constructed environment with isomorphic pressures (Boxenbaum & Jonsson, 2017). While coercive pressures stem from vertically positioned actors (e.g., state), mimetic and normative pressures are horizontal and stem from peers. Boxenbaum and Jonsson (2017, pp. 81-84) distinguish several critical questions concerning isomorphism:

1. „*Similar to what?* […] what the relevant environment is to which organizations are thought to become (or not become) isomorphic?
2. *Similar in what?*
3. *Similarity as diffusion?* […] an implicit assumption that diffusion equals isomorphism […] needs verification.
4. *Similarity in a heterogeneous environment*. […] the field has increasingly become conceptualized as ambiguous and heterogeneous with multiple institutional pressures that often result in conflicting pressures for conformity.
5. *Similarity and heterogeneous organizational response*."

Boxenbaum and Jonsson (2017) note that the social sector approach implies that the environment is exogenous (external) to the organisation; according to the organisational field approach, actors structure the environment. This study adopts the organisational field approach, implying that isomorphic pressures are endogenous to organisations. Boxenbaum and Jonsson (2017) also distinguish two perspectives concerning heterogeneous organisational response. Thus, one perspective portrays institutions as visible limitations of actions, and actors may strategise or manipulate institutions. Another stance conceptualises institutions as social facts, assuming that organisations internalise institutional pressures and comply naturally. However, responses may vary

not because of conscious choices but, e.g., because of the limited capabilities to become isomorphic. There may be some contingencies in time, space, or local conditions. The dissertation does not take any of these assumptions in advance. Instead, the empirical part of the thesis explores whether isomorphic pressures may lead to the institutionalisation of S3 (natural compliance) or whether actors attempt to withstand them.

2.1.3. Institutional stability and change in the fields

The section discusses the sources of stability and change in the organisational fields that affect institutionalisation. Firstly, it elaborates on the concept of institutions, with particular attention to its elements, fostering stability in the field and explains the role of *isomorphic pressures* as the mechanisms to enforce institutions. It also outlines the *carriers of institutions* that convey them to field organisations. Secondly, the subchapter introduces institutional elements that vary across fields: *institutional logics, relational systems, actors* and *field boundaries*.

2.1.3.1. Sources of institutional stability in the field

Organisations, comprising an organisational field, adjust their behaviour according to shared institutions that guide their actions (Wooten & Hoffman, 2017). These are "regulatory, normative, and cultural-cognitive elements" (Scott, 2014, p. 225). According to Scott (2014), the elements mentioned above are three *pillars of institutions* that comprise overarching institutional structures that resist change and are common to the organisational fields. Table 4 summarises key aspects of the three pillars of institutions.

Table 4 – Three pillars of Institutions

	Regulative	**Normative**	**Cultural-cognitive**
Basis of compliance	Expedience	Social obligation	*Taken-for-grantedness*; Shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules; Laws; Sanctions	Certifications; Accreditations	Common beliefs; shared logics of action; isomorphism
Affect	Fear Guilt/ Innocence	Shame/ Honour	Certainty/ Confusion
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible; Recognisable; Culturally supported

Source: Scott, 2014, p. 60.

Institutions are conveyed by various types of carriers that "point to a set of fundamental mechanisms that allow us to account for how ideas move through space and time, who or what is transporting them, and how they may be transformed by their journey" (Scott, 2014, p. 95). Scott (2014) distinguishes four types of carriers, as presented in Table 5.

Table 5 – Institutional Pillars and Carriers

Carriers	*Pillars*		
	Regulative	**Normative**	**Cultural-cognitive**
Symbolic systems	Rules Laws	Values Expectations Standards	Categories Typifications Schemas Frames
Relational systems	Governance systems Power systems	Regimes Authority systems	Structural isomorphism Identities
Activities	Monitoring Sanctioning Disrupting	Roles, jobs Routines Habits Repertoires of collective action	Predispositions Scripts
Artifacts	Objects complying with mandated specifications	Objects meeting conventions, standards	Objects possessing symbolic value

Source: Scott, 2014, p. 96.

Scott (2014) also distinguishes elements that vary among fields, which are *institutional logics*, *actors*, *relational systems* and *organisational field boundaries*. They are elaborated below.

2.1.3.2. Sources of institutional variation across fields

2.1.3.2.1. Institutional logics

The seminal work of Meyer and Rowan (1997) underlines the similarity of structures paired with practice variation across organisations. However, the neo-institutional theory was mainly understood as a theory of isomorphism, while practice variation received less attention (Lounsbury, 2008). Practice variation between organisations might stem from the fact that field-level organisations influence only some sub-groups of organisations but not others (Lounsbury, 2001). Further attention to the variation of organisational practices led to a change in conceptualisation, replacing the homogenous view of a field with multiple organisational fields and multiple competing logics perspectives (Lounsbury, 2007). *Institutional logics* might be defined as a "socially constructed, historical pattern of material practices, assumptions, values, beliefs, and rules by which individuals produce and reproduce their material subsistence, organise time and space,

and provide meaning to their social reality."[2] Organisational responses may differ when confronted with multiple logics (Greenwood et al., 2010).

2.1.3.2.2. Actors and institutional work

Isomorphism points to the exogenous pressures to adopt specific ways of organisational behaviour, but researchers have also drawn attention to actors' roles in shaping and diffusing institutions. The practices of an individual or collective actors that aim to create, maintain or disrupt institutions are recognised as *institutional work* (Lawrence, Suddaby & Leca, 2011). It draws attention to the differences in organisational practices despite the similarity of organisational structures, as has been noted by Meyer and Rowan (1977). Creation, maintenance and disruption of institutions require different forms of work, as presented in Table 6.

Table 6 – Aims and forms of institutional work

Aim	Creation	Maintenance	Disruption
Forms of work	1. Advocacy; 2. Defining; 3. Vesting; 4. Constructing identities; 5. Changing normative associations; 6. Constructing normative networks; 7. Mimicry; 8. Theorising; 9. Educating.	1. Enabling work; 2. Policing; 3. Deterring; 4. Valorising; 5. Demonising; 6. Mythologising; 7. Embedding; 8. Routinising.	1. Disconnecting sanctions; 2. Disassociating moral foundations; 3. Undermining assumptions and beliefs.

Source: own elaboration, based on Lawrence & Suddaby, 2006, p. 221; p. 230; p. 235.

Institutional work may aim either at extant practices (*practice work*) or boundaries between individuals or their groups (*boundary work*), and these forms happen recursively (Zietsma & Lawrence, 2010). Perkmann and Spicer (2008) distinguish *political*, *technical,* and *cultural* types of institutional work. *Political work* intends to establish a different constellation of actors and to change rules and property rights. *Technical work* aims to establish a framework that may guide future action. *Cultural work* targets values and beliefs and aligns them with the practices grounded within a broader discourse.

Notable studies on institutional work have been conducted by Barley and Tolbert (1997) and Jarzabkowski (2008). Both studies analyse institutionalisation, combining the neo-institutional

2 As acknowledged by Thornton and Ocasio (1999), the definition draws upon earlier works of Jackall (1988, *Moral Mazes: The World of Corporate Managers*), and Friedland and Alford (1991, *Bringing society back in: Symbols, practices, and institutional contradictions*)

perspective with structuration theory. Structuration theory was developed by Giddens (1984), and it points to the relationship between existing structures and people's actions, reinforcing or modifying these structures (Orlikowski, 1996).

2.1.3.4.3. Relational systems and power

Relational systems reflect the links between organisations, resulting in more extensive networks (DiMaggio & Powell, 1983; Scott, 2014). Governance systems comprise a subset of relational systems (Scott, 2014).

The notion of networks and relations between actors and organisations is pivotal to neo-institutionalism. However, network research developed in a separate intellectual stream (Powell & Oberg, 2017). The stream is known as network theory, and it is beyond the scope of this dissertation to elaborate on it. Still, both streams combine and influence each other (Powell & Oberg, 2017). Several notions closely relate to neo-institutionalism and specifically the concepts of organisational field and emergence of common institutions and their diffusion. Thus, organisations in the field are connected through economic relationships and share a specific social environment, as implied by the notion of embeddedness in inter-organisational networks (Granovetter, 1985). However, despite a connection between network and field concepts, they are not identical: networks express merely horizontal relationships, while fields are more complex and include heterogeneous actors (Powell & Oberg, 2017). Thus, institutions might be seen as more vertical structures, reflecting conventions based on power and influence (Powell & Oberg, 2017).

In the relational systems' context, *power* might be defined as "a property of relationships such that the beliefs or behaviours of an actor are affected by another actor or system" (Lawrence & Buchanan, 2017, p. 480). Power might operate in two distinct modes: *systemic* and *episodic* (Lawrence et al., 2005; Lawrence, Malhotra & Morris, 2012; Lawrence & Buchanan, 2017). "Episodic power refers to discrete, strategic political acts initiated by self-interested actors" (Lawrence et al., 2005, p. 182), while "systemic forms of power work through the routine, ongoing practices of the organisation" (Lawrence et al., 2005, p. 182). Hence, institutions influence behaviour and beliefs, and actors develop strategies to affect institutional arrangements, suggesting a connection between power and institutions (Lawrence & Buchanan, 2017). *Institutional control* and *institutional agency* determine the institutional politics of a specific situation (Lawrence & Buchanan, 2017). Institutional control reflects the impact of institutions on actors and organisations,

linking to systemic power, while institutional agency refers to the institutional work of actors and relies on episodic power (Lawrence & Buchanan, 2017).

2.1.3.3. Organisational field boundaries

Scott (2014) notes that organisational fields are open systems and that their boundaries must be determined empirically. There are *spatial* and *temporal boundaries* of an organisational field (Scott, 2014). Spatial boundaries are flexible and might be set depending on a research question, e.g., national or international level (Scott, 2014). For example, researching practices' transplantation into different contexts and their diffusion might require conceptualising the field at the international level, as in the study by Kostova (1999). Another aspect is selecting an appropriate time frame to analyse change processes in the field (Scott, 2014). Thus, *institutions* might be *fast-moving* or *slow-moving* (Roland, 2004). Fast-moving institutions are usually formal and may change rapidly, but not that often. These are commonly political institutions. Slow-moving institutions relate to culture and change slowly but continuously. The particular role of slow-moving institutions, represented by culture, ideology and world views, may explain the outcome of change, which occurs in the interaction of both types of institutions (Roland, 2004).

Roland (2004) also outlines two perspectives on institutions:

1. In the *functional* perspective, institutions correspond to human interaction needs. They may be created and replaced when necessary.
2. In the *macro-systemic* view, institutions comprise a system and complement each other. From this perspective, replacing one institution without affecting complementary institutions is improbable. Sometimes complementary institutions may be so strong that they impede the replacement of affiliated institutions.

Studying institutionalisation at the international level might require considering additional factors. Kostova (1999) identified three contextual categories relevant for multinational companies:

1. *Social* (the environment's regulatory, cognitive, and normative aspects that may differ between home and host countries);
2. *Organisational* (the recipient unit's openness for learning and cultural compatibility with the practice to be adopted);

3. *Relational* (the attitude of the recipient organisation towards the core organisation and resource dependency).

In line with the above, Roland (2004) hypothesises that fast-moving institutions' simple transplantation into different cultural settings may not bring the desired outcome if slow-moving institutions differ. Roland (2004) suggests that a country may be more likely to develop fast-moving institutions suitable for its context if it can draw upon a rich and diverse stock of formerly accumulated knowledge. Thus, institutionalising practices requires a successful transfer of knowledge, beliefs, and meanings, which implies various challenges (Kostova, 1999).

2.1.3.4. Structuring organisational fields

The structuring of organisational fields results from the institutionalisation of meaning as actors interact (Gray, Purdy and Ansari, 2015). Consequently, institutional change occurs if actors reproduce existing frames with some modification, which result from (Gray, Purdy and Ansari, 2015):

1. *Misfirings* (an actor fails to interpret and uphold conveyed frame correctly);
2. *Laminations* (adding new interpretation as the response to conveyed frame).

According to Gray, Purdy and Ansari (2015), there are three types of *misfirings*:

1. *Keying* (same activity is interpreted differently);
2. *Frame breaks* (actors perceive extant frame as not reasonable);
3. *Ambiguity* (different interpretations exist).

When the powerful actors cannot inhibit a new frame, a different interpretation might emerge, and lamination occurs, resulting in the choice of interpretations that may diffuse and be institutionalised at higher levels (Gray et al., 2015). The process implies *amplification* across levels, which occurs in three aspects (Gray et al., 2015, pp. 120-122):

1. *Scope* (a broader group of actors adopts the frame and expands it through networks of interactions);
2. *Regularity* (frequent use of specific frame);
3. *Emotional intensification* (through interaction rituals).

Therefore, following Gray and others (2015), there are four generic patterns of institutional change:

1. Existing frame amplifies (implies institutional stability through maintaining frame dominance or institutional distancing when some actors avoid compliance);
2. Replacing existing frame (because of external pressures, internal pressures from other actors, or importing higher-level master frame);

3. Modified frame amplifies (merging frames or situated improvising);
4. Multiple frames co-exist.

Researchers also examined conditions under which micro-level processes reinforce existing institutions or foster change. Three types of mechanisms may either reinforce or change present routines (Colyvas and Maroulis, 2015):

1. *Reproduction* (pass the rules from parent to offspring organisation);
2. *Retrospective* mechanisms (learning based on what more successful partners have previously done);
3. *Prospective* mechanisms (adapting routines based on an expectation of what more successful peers may do).

Colyvas and Maroulis, 2015 note that reproduction and retrospective mechanisms reinforce present rules and may lead to institutionalising new ones if selection procedures work. In contrast, prospective mechanisms may drive the institutionalisation of new practices even in absent selection. The choice of mechanisms might link to legitimacy, which affects the balance between stability and change in the fields (Colyvas & Maroulis, 2015). Stability implies top-down reinforcement of legitimacy via a positive feedback loop, while change originates from the bottom and weakens established institutions' legitimacy (Bitektine & Haack, 2015). As a lever for these processes, Bitektine and Haack (2015) identify judgements' consistency by different actors, making the judgements either valid or not.

The discussion on structuring organisational fields reflects the multi-level approach to studying institutionalisation, as represented by several notable studies (see: Kostova, 1999; Zeitz et al., 1999; Bitektine & Haack, 2015). The approach might be suitable to embrace complexity and study *fields in flux*, characterised by dynamics of shifting industry boundaries, emerging sectors and network forms, and unstable ecosystems (Meyer, Gaba & Colwell, 2005). Thus, conceptualising a field with empirically defined boundaries might also determine what different forces are present and acting in that field. Considering the similarity of structures, driven by isomorphic pressures, and practice variation simultaneously provides a more comprehensive perspective on the interplay between institutional stability and change. It also links neo-institutionalism with the structuration theory.

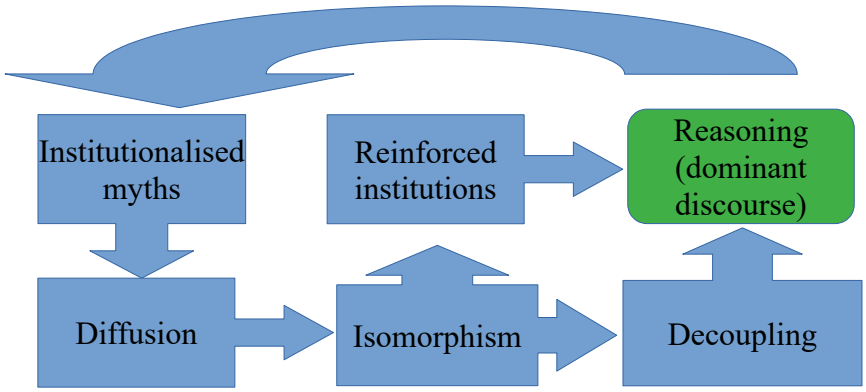
2.1.4. Summary

The chapter summarised the neo-institutional theory and its core concepts relevant to this research project. It positioned neo-institutionalism as a perspective on change and introduced the concept of institutionalisation to study both the change process and its outcome. The connections between the neo-institutional theory with other relevant theoretical perspectives, such as diffusion of innovation and fashion theory, have been illuminated and discussed to the degree deemed relevant for the current research project. The chapter introduced legitimacy as a significant explanatory concept, determining the choice between institutional stability and change in the field. It thoroughly discussed the organisational field concept, which represents the dominant level of analysis in the neo-institutional theory, including institutional pillars fostering stability in the field, variable elements across fields, and field structuring process.

Summing up, an organisational field might be formed around a specific issue (in this study, it is S3). All the relevant organisations forming the field strive to maintain legitimacy both internally and externally. Internally, an organisation might seek to adopt rational means to achieve its goals. However, compliance with external pressures from the environment might require adopting solutions that are not appropriate or practicable for an organisation. These solutions might represent rationalised myths and be commonly perceived as most effective and desirable in the organisation's environment. In that case, the organisation may lose its legitimacy when rejecting them. The pressure to comply with rationalised myths might cause isomorphic outcomes, meaning that organisations in the field become similar. However, in reality, an organisation might choose to decouple its practices from official structures and maintain legitimacy without compromising its goals or efficiency.

The premise taken in this study is in line with Boxenbaum and Jonsson (2017). It suggests that diffusion of the smart specialisations' initial assumptions may evoke isomorphic pressures that lead to the institutionalisation of the concept or decoupling. The logic is represented in Figure 1.

Figure 1 – *Relationship between diffusion, isomorphism, decoupling in the institutionalisation process*



Source: own elaboration, based on Boxenbaum & Jonsson, 2017

2.2. Innovation policy through the lens of neo-institutionalism

The current subchapter focuses on S3 related issues and aims to define the analysis unit. It draws upon concepts closely connected to S3 and EDP, such as *innovation policy*, *innovation systems, participation*, and *collaborative governance*. The neo-institutional theory frames the review, connecting theoretical perspective with the literature relevant to the research context.

Firstly, the subchapter discusses developments in innovation policy research and positions S3 in the context. *Innovation policy* offers solutions to innovators' problems. Its relevance for practice resulted in the rapid development of research. Enhanced knowledge of what might work and many policy-practice recommendations urge policy-makers to adopt progressive solutions, ensuring policy's legitimacy. However, especially concerning S3, theory develops much faster than practice (Foray, 2015; Edquist, 2019). Therefore, rationalised myths might emerge in innovation policy, which would suggest the existence of isomorphic pressures and eventually also decoupling.

Secondly, it is helpful to review the literature on preceding approaches to determine the relevant actors and other field elements concerning S3. Thus, EDP means integrating fragmented knowledge, distributed among different actors, which ideally should lead to discoveries of new opportunities with potential for innovation (European Commission, n.d.-g, para. 1), which is congruent with the *innovation system* approach.

Finally, the subchapter addresses the key elements of an organisational field: actors, structures, and interaction mechanisms through *participative approaches*. It connects the relevant concepts from neo-institutionalism with innovation policy implied by S3, sketching possible organisational field arrangements for S3.

The subchapter includes three sections. The first section reviews innovation policy research and its advancement towards S3. Another section considers developments in research on innovation systems and their implications for S3. The third section outlines the spectrum of participative approaches that might serve as a basis for designing stakeholders' involvement in EDP.

2.2.1. Innovation policy research

The section provides an overview of how the policy rationale evolved and positions S3 in innovation policy research. It reviews possible policy failures and their antecedents.

Innovation policy may be defined as a public intervention to support generation, market introduction and diffusion of innovation, and may target actors on the supply and demand sides of innovation (Edler, Cunningham & Gök, 2016). Edler and colleagues note that the policy aiming to support innovation may not always be explicitly defined as such. It may intertwine with other policies, such as science, research, and technology. Policy aiming to support innovation comprehensively may be viewed as a *functional innovation policy*, while policies aiming to support particular sectors may be named *sectoral innovation policies* (Edler et al., 2016, pp. 3-4).

The rationale behind policy interventions has altered with changing views of innovation. The *market failure* rationale emerged with the notion of *appropriability*, meaning that subsequent entrants are often profiting more from innovation than the innovator (Teece, 1986; Anderson & Tushman, 1990). Extant literature associates this phenomenon with market failure, and it serves to justify public support for innovation. The *innovation system* approach gave rise to the *system failure* policy rationale. This approach presumes that policy needs to support functions in the system that do not perform sufficiently to enhance the creation and use of innovation (Edler et al., 2016). Performance limitations may include the following areas (Edler et al., 2016, p. 5):

1. Legal, regulatory and financial conditions;
2. System capabilities;
3. Exchange, interaction and cooperation deficits.

Hence, there are three types of systemic failures: institutional infrastructure, organisational landscape, and linking behaviour (Pyka, Kudic & Müller, 2019).

Edquist (2011) argues for identifying system failures before designing the policy and suggests a *diagnostic analysis* based on comparing different innovation systems, considering activities and categories of innovation to be improved. Private and public organisations perform the activities in innovation systems, and work division varies over time and space contexts (Edquist, 2011). Table 7 provides a sample overview of the innovation system activities, also referred to as functions.

Table 7 – Sample functions of innovation systems

Functions	**Sample literature**
(1) provision of knowledge inputs (R&D results, fostering new knowledge and competence building through learning); (2) demand-side activities (market formation for new products and articulating of quality requirements from the demand side); (3) provision of constituents for innovation systems (forming organisational landscape for the development of novel innovation fields, networking to integrate new knowledge elements and constitute institutions); (4)support services for innovating firms (incubation activities, financing, and consulting).	Edquist, 2005; Edquist, 2011, p. 1729
(1) knowledge development and diffusion; (2) influence on the direction of search; (3) entrepreneurial experimentation; (4) market formation; (5) legitimation; (6) resource mobilisation; (7) development of positive externalities.	Bergek et al., 2008, pp. 414-418

Source: own elaboration

In Edquist's (2011) view, policy objectives should include indicators and connect to the system's categories that fail to deliver desired outcomes. Thus, policy design requires knowing *innovation intensity* in different categories, preferred *direction* to channel further development, and *significant innovations* in particular categories (Edquist, 2011).

S3 approach takes up the system failure policy rationale and policy objectives as advocated by Edquist (2011) and develops it further. Thus, Foray (2016a) emphasises two bifurcations that determine the place of S3 in the policy space. The first distinction emerges between *sector-neutral horizontal policies* that support everything to the same extent and *sector non-neutral policies*. Foray (2016a) argues that horizontal policies work well for top regions but failed to deliver desired results and foster catch up in lagging regions. Hence, according to Foray (2016a), focusing on specific priorities and sector non-neutral policies should be more appropriate for these regions' weak innovation systems and complex environments. Noteworthy that, in Foray's (2016a) view, sector non-neutral policies are *haute couture*. They are vertical and tailor-made for specific fields and consider the specific needs of the businesses to create *micro-cosmos* for innovation. These policies require more resources than *ready-to-wear* solutions that may apply to horizontal policies. From this logic stems argument for prioritisation: as it is practically impossible to prepare tailor-made solutions for everyone, policy-makers should support domains that show most perspective activities and initiatives.

In Foray's (2016a) view, there is a risk in making the wrong choices, especially when applying a top-down approach when the government decides what to support. Hence, one can minimise these risks when new policies are designed using a bottom-up approach and emerge from the EDP. Therefore, Foray (2016a) warns of three mistakes when designing S3:

1. The government is a central planner who asks consulting firms to prepare reports or calculate relative specialisations and then selects domains on this ground;
2. Sectoral prioritisation. Noteworthy, Foray pleads for the *finer level of granularity*, however, without elaborating further on how this level should be defined, except that supported activities should be *new* or represent an *emerging micro-system of innovation*;
3. Permanent choices.

In a broader sense, EDP may be seen as a means to better inform policy-making by collecting elaborate evidence that minimises the probability of policy failures. Evidence-based policy-making holds on the idea that better decisions have considered most of the available information, assuming an iterative process of feedback based on continuous monitoring and evaluation, enabling identification and correction of errors (Howlett, 2009). Howlett (2009) notes that policy failures and solutions from the evidence-based policy perspective may relate to governmental or non-governmental "policy analytical capacity". However, even advanced economies may possess an insufficient level of analytical policy capacity to pursue evidence-based policy, resulting in that the approach may fail to deliver its goals: to improve policy-making processes and outcomes (Howlett, 2009).

Howlett (2009, p. 160) names the foremost causes of policy failures, as identified in academic literature:

1 An attempt by the overreaching government to address "wicked problems" with no apparent cause or known solution;
2 Lacking anticipation by governments of suggested courses of action or vulnerability of policy or administrative systems;
3 Various implementation failures while translating decisions into practice, often when decision-makers failed to oversight the implementers;
4 Failures in the evaluation of policy outcomes and/or learning from previous experiences.

Above mentioned policy failures may occur at different stages of the policy cycle, but there are possible strategies to deal with them, as illustrated in Table 8:

Table 8 – Policy Failures and Management Strategies by Stage of the Policy Cycle

Policy stages	**Problem**	**Solution**
Agenda-setting	Overreaching governments	Better clarification and precise articulation of government goals and resource capabilities
Policy formulation	Attempting to deal with wicked problems	Provision of better data and research on policy problem causation and alternative solutions
Decision-making	Failing to anticipate policy consequences or risk of system structure failure	Better risk analysis and assessment and its integration into a decision- making processes
Policy implementation	Principle-agent problems, oversight failures, etc.	More careful matching of administrative resources to policy goals and better design of monitoring and inspection systems
Policy evaluation	Lack of learning	Development of improved benchmarking and performance measurement systems and integration of this information into future policy deliberations

Source: Howlett, 2009, p. 162

To conclude, the policy measures aiming to correct market failures were deemed insufficient with the notion of systemic failures that emerged with the *systems of innovation* approach. However, scholars disagree whether the market failure rationale should be replaced or complemented by the system failure perspective, which results in distinct bodies of literature advocating one or another point of view (Bleda & Del Río, 2013). Therefore, market failure rationale may persist because of its simplicity and roots in neoclassical economics, appearing familiar and well elaborated, in contrast to the indistinct and complex system failure approach stemming from evolutionary economics (Dodgson et al., 2011).

Considering the above, it becomes clear that S3 aims to differentiate innovation policy concerning specific conditions in the regions and addresses systemic failures. It also encourages the re-configuration of extant sectoral boundaries in favour of an inter-sectoral and inclusive approach. From the neo-institutional theory perspective, it would imply building organisational fields around specific specialisation domains, with varying actors, institutional logics, relational systems and the need to determine the field boundaries. Simultaneously, S3 advocates prioritisation through participative policy-making as a suitable means across regions. Latter stands for institutional elements that foster compliance and isomorphic outcomes. Extant research also suggests that, given its complexity, innovation policy aiming at system failures might be challenging at different stages, require specific policy capacity and time for learning.

2.2.2. Innovation systems as determinants of the field boundaries

The section discusses different conceptualisations of the innovation system and implications for the boundaries of an emerging organisational field around S3.

Systemic approaches to innovation that replaced linear models became prominent in the 1990s with the seminal work of Lundvall (1992), representing a national perspective. However, Freeman traces its roots back to the 19th century and economist List and his work *The National System of Political Economy* from 1841 (for the review of historical perspective on national innovation systems, see Freeman, 1995). Later, different approaches were developed within the perspective of the innovation system. Most prominent, though not exhaustive, include *national* (Lundvall, 1992; Lundvall, 2007), regional (Cooke, Uranga & Etxebarria, 1997; Cooke, 2001), sectoral (Malerba, 2002), and technological (Carlsson & Stankiewicz, 1991; Bergek et al., 2008). In further discussion, these approaches will be covered as place-related and industry-related perspectives. However, both perspectives often intertwine. For example, particular industries may incline to locate in some regions more than others, affecting the region's characteristics in terms of its industrial structure and dominant knowledge base.

2.2.2.1. Spatial boundaries

Emphasis on place-related factors is present across many concepts in the extant literature. Those that particularly stress the importance of place and region for innovation include industrial districts, clusters, innovative milieux, learning regions, and regional innovation systems (Asheim, Boschma & Cooke, 2011). For this research project, the innovation systems approach has been deemed most relevant from the theoretical aspect because it directly connects to S3.

Even though the regional innovation systems perspective is dominant in the academic literature, arguments for the national approach also exist. Thus, analysis at the national level allows comparing innovation systems operating in different contexts that usually match the national borders (Liu & White, 2001). Later, scholars argued for a more nuanced approach to innovation systems in terms of place, resulting in the increasing interest in the analysis at the regional level (Altenburg, Schmitz & Stamm, 2008). Such analysis accounts for the competencies and autonomous possibilities of the regions and their cultural base, which creates systemic potential (Cooke, Uranga & Etxebarria

(1997). Other reasons include context, innovations' embeddedness in social relations, and clusters, based on geographic proximity (Doloreux & Parto, 2005). The disadvantage of the regional approach stems from lacking uniformity in determining regional boundaries, making it difficult to compare different studies (Doloreux & Parto, 2005). Cooke, Uranga, and Etxebarria (1998) suggest defining the region concerning administrative and cultural aspects.

Extant research focusing on the regional perspective reveals differences between regional innovation systems even within national states (Camagni, Capello & Lenzi, 2014). These may refer to their knowledge base (Asheim & Coenen, 2005), embeddedness within a local network (Asheim & Isaksen, 1997) or innovation pattern (Camagni, Capello & Lenzi, 2014). Therefore, regions may need individualised policy goals and approaches (Tödtling & Trippl, 2005; Agrawal et al., 2014; Camagni, Capello & Lenzi, 2014).

Scholars have analysed the impact of formal institutions at the subnational level and showed that quality of government (measured by the European Quality of Government Index, EQI) is a determinant of innovation, especially in the peripheral regions of the EU (Rodríguez-Pose & Di Cataldo, 2015). Rodríguez-Pose and Di Cataldo (2015) suggest that traditional factors, such as socio-economic conditions, the share of business R&D expenditures, or knowledge spillovers become insignificant in the peripheral regions when the quality of government (measured by the EQI index) is low. However, researchers warn of a simplified distinction between core and peripheral regions (Camagni, Capello & Lenzi, 2014). Although not every region has favourable institutional and organisational circumstances, including political and companies level, it may have the essential elements necessary to develop the regional innovation system (Cooke et al., 1998).

Regional innovation system comprises subsystems of knowledge application and exploitation and knowledge generation and diffusion (Autio, 1998; Tödtling & Trippl). A region-dependent cultural and socio-economic setting affects both subsystems through its policy and exchange of knowledge and other resources (Tödtling & Trippl, 2011). Regional innovation systems interact with different actors at national and international levels, including other regional innovation systems, to sustain innovative activities (Tödtling & Trippl, 2011).

Scholars argued for different sources of knowledge spillovers from the place-based perspective that may foster innovation, which resulted in the specialisation-diversification debate (see: Glaeser et al., 1992). Diversification implies spillovers between different industries while specialisation -

within the same industry (Glaeser et al., 1992). The more recent view is that neither diversification nor specialisation per se denotes optimal conditions for mutual learning (Asheim, Boschma & Cooke, 2011). Instead, better utilisation of newly gained knowledge results from knowledge spillovers between technologically related sectors (Asheim, Boschma & Cooke, 2011).

2.2.2.2. Technology, sectors and innovation system boundaries

Differently from national and regional innovation systems, technological and sectoral innovation systems focus on industry and technology-related factors as enablers for innovation. Carlsson and Stankiewicz (1991) emphasise flows of knowledge and competencies through the networks, underlying technology generation, diffusion, and utilisation. When reaching critical mass, networks could result in clusters within a particular industry or connect several industries (Carlsson & Stankiewicz, 1991).

One perspective of the innovation system approach shifts attention to a particular sector. According to Malerba and Orsenigo (1996), innovation models differ between sectors but are similar within a particular sector across different countries. A relationship between the specificity of technology and the domination of individual Schumpeter's innovation models, regardless of the country, became the basis for the *technological regime* concept proposed by Malerba and Orsenigo (1997). The technological regime explains sectoral innovation differences, resulting from knowledge characteristics at the base of specific technology. These findings gave rise to the sectoral approach within innovation systems. However, later Malerba (2004) admits that firms' conditions to generate and use capabilities may differ across countries. That is because these conditions depend on university research, the effectiveness of mechanisms for combining science and industry, horizontal and vertical ties between local companies, producer and user interaction, and innovation efforts undertaken by the company (Malerba, 2004, p. 23).

Malerba (2002) defines the "sectoral system of innovation and production" as "a set of new and established products for specific uses and the set of agents carrying out market and non-market interactions for the creation, production, and sale of those products" (Malerba, 2002, p. 248). The dimensions of the sectoral system include „knowledge base, technologies, inputs and demand" (Malerba, 2002, p. 248), and interactions among agents through „communication, exchange, competition, cooperation, and command" (Malerba, 2002, p. 248). In Malerba's (2002, p. 257) view, institutions have the power to shape the environment by favouring some sectoral systems

more than others. The initial definition of sectoral innovation systems can be structured by aggregating the elements into three major building blocks: knowledge and technology, actors and networks, and institutions (Yu et al., 2017, p. 192). Demand conditions are also relevant (Lee & Malerba, 2017).

Notably, studying markets' structure and innovation replaced simple distinction between high-tech and low-tech sectors, resulting in the distinction between Schumpeter's Mark I and Mark II sectors, deeply rooted in the notions of *creative destruction* and *creative accumulation* (Malerba & Adams, 2014).

2.2.2.3. Integrated conceptualisation of innovation system boundaries

One concept that marks the intersection of place and industry perspectives might be knowledge bases. Regions can differ in their knowledge bases, which could be relevant for the importance of proximity and place-based institutions for innovation. Scholars distinguish between three *knowledge bases* that drive innovations (Asheim, Boschma & Cooke, 2011, pp. 896-898):

1. *Analytical* knowledge base implies high importance of science, is often codified, and is paramount in specific industries, e.g., biotechnology.
2. *Synthetic* knowledge base refers to applying the existing knowledge and its novel combination, which often occurs in engineering related activities. Reliance upon a synthetic knowledge base often results in incremental innovation.
3. *Symbolic* knowledge relates to artistic activities, design, and branding. It has a substantial tacit component. Accordingly, its meaning varies across places and between different groups of people.

Asheim et al. (2011) noted that spatial proximity is not equally important for different knowledge bases: a higher level of codification implies higher uniformity of meaning across places. A high tacit component makes the knowledge base more place-specific. However, recent research suggests that geographical proximity and regional networks matter even in highly networked sectors, and collaborative engagement across the world may not compensate for the low capabilities of local research organisations (Gilding et al., 2020). According to Tojeiro-Rivero and Moreno (2019), regional context conditions the returns that an enterprise may gain from its networking activities and may affect its number of product innovations. Specifically, the knowledge and the type of

holding sector (private or public) affected the effectiveness of R&D cooperation and R&D outsourcing strategies (Tojeiro-Rivero & Moreno, 2019).

Concerning knowledge, distinct sectors may need different preconditions for innovation. Hence, "new to the market" innovations rely more on the scientific knowledge base and require business-science cooperation, while incremental and adapted innovations demand cooperation with service firms (Tödtling, Lehner & Kaufmann, 2009). Also, different technology types rely upon learning by interacting with various actors (Malhotra, Schmidt & Huenteler, 2019):

- Complex technologies that rely on specific knowledge bases need inter-sectoral learning with suppliers of different subsystems;
- Sectors without complex technology may learn by interacting with users (learning, triggered by demand);
- Complex technologies in both product architecture and production processes require learning with various sectors across the value chain.

Technological and sectoral perspectives may link to the notion of *related variety*, which claims that knowledge spillovers primarily occur within similar sectors (Frenken, Van Oort & Verburg, 2007). Thus, *unrelated variety* implies the abundance of distant sectors in the region, while similar sectors suggest *related variety*. Hence, related variety may be linked to existing *proximity* between sectors. Proximity implies that if the country is good at producing good *i*, it may equally well produce good *j*, requiring similar conditions (Hidalgo et al., 2007). In line with the innovation systems literature, this may suggest sharing, e.g., a similar knowledge base or institutional environment. Therefore, related variety implies the possibility of differentiating into another domain while using existing capabilities. Scholars measured related variety based on industrial classification (Frenken et al., 2007; Boschma & Iammarino, 2009) or developed methodologies such as *Revealed Skill Mobility Index* (Neffke & Henning, 2013). Alternatively, Hidalgo and others (2007) argue the proximity can be measured via export and put it as follows: "the proximity *f* between products *i* and *j* is the minimum of the pairwise conditional probabilities of a country exporting a good given that it exports another" (Hidalgo et al., 2007, p. 484). Hidalgo et al. (2007) relate export to economic specialisation via *revealed comparative advantage* (RCA), which is the ratio between the share of a particular product in the countries' export and the share in the global export volume. The two models are not necessarily contrasting.

The notion of proximity traditionally implied the firms' geographical proximity. However, with the notion of related variety and technological and sectoral perspectives on innovation systems, the knowledge flows from outside the region received more attention, as in the exemplary study by Boschma and Iammarino (2009). Recently, scholars also paid more attention to unrelated diversification as a driver for break-through innovations (Boschma et al., 2017).

S3 relates to both place and industry perspectives. The place perspective reflects a place-based approach to innovation policy-making, which S3 claims to take up. EU member states have prepared their strategies either at regional or national levels, or both. Sectoral and technological perspectives relate to the way priorities have been defined. Some regions defined them at the technology level and attempted to assign specific sectors to the description of priorities. Sometimes particular sectors have been prioritised. Recently, scholars attempted to combine both perspectives in a more elaborated approach and noted that place and path dependence might reinforce each other as globally present regimes adapt to local conditions (Boschma et al., 2017). The following quotation captures the distinction between these approaches:

> *"Place dependence stems from the local reproduction of localised knowledge, territorial institutions and vested interests embedded in places, which tends to hamper processes of unrelated diversification of a regional economy. Path dependence stems from shared cognitive frames, standards and institutions embedded in global socio-technical regimes, which tends to hamper the development of new niches and their further development into alternative socio-technical regimes"* (Boschma et al., 2017, p. 37).

Combining both perspectives resulted in a *typology of regional diversification* across two dimensions: regional, in terms of related and unrelated variety, and sectoral, in terms of niche creation versus regime adoption (Boschma et al., 2017):

1. *Replication* implies the development of a new industry through the adoption of existing technology, relating to its current capabilities and knowledge;
2. *Transplantation* implies developing a new industry by adopting an existing technology that does not relate to existing capabilities in the region.
3. *Exaptation* means applying existing technology in different, initially unforeseen ways.
4. *Saltation* implies creating break-through innovations that are new to the world.

Noteworthy, systemic innovation models represent the development of the academic community's views. Assumptions of the linear view still hold in policy practice, which affects the ability of the regions lagging in innovation performance to benefit from alternative approaches, such as S3 (Marques & Morgan, 2018). Marques and Morgan (2018) relate the viability of the linear model to the regional innovation paradox. Oughton, Landabaso and Morgan (2002) defined the regional innovation paradox as lagging behind regions' inability to employ the funds for innovation because of their lack of absorptive capacity to do so.

2.2.3. Structuring fields around innovation policy

The section outlines the main elements of an organisational field from the perspective of participative and inclusive innovation policy-making, as is S3. Specifically, it addresses:

- The issues that policy-makers may face when pursuing inclusive policy, linked to institutional logics and actors;
- Configurations of the governance structure;
- Various classifications of inclusive and participative approaches and related challenges for stakeholders' involvement.

2.2.3.1. Institutional logics and actors

General development in literature on policy-making evolved from design orientation in the 1980s and 1990s towards decentralised governance and a more inclusive, participative, and emerging process (Howlett, 2014). However, the state faces difficulties pursuing such industrial policy and negotiating with business (Brunsson, 2007). In Brunsson's (2007) view, it is ambitious for the state to control firms because it is a political organisation and aims to represent different ideas, while companies are hierarchical and have expertise in their domain. The state is an open system and may be perceived as responsible for nearly everything, which is disadvantageous when bargaining with the firms. As Brunsson explains it:

> *"Because of this openness, political leadership is responsible for positive decisions to support corporate projects — but this is not all. Since even rejections are regarded as active decisions, the politicians are held responsible for these as well. In order to cope with saying 'no', they need arguments which the surrounding world will regard as legitimate. Thus, both acceptance and rejection have to be equally well-motivated. Strong arguments in favour of approval are willingly supplied by the aid-seekers. But because of the companies' superior*

knowledge, it is often difficult for the state to find counterarguments which the applicants cannot refute. And without credible counterarguments, the state finds it difficult to justify its refusal" (Brunsson, 2007, p. 94).

Brunsson (2007) differentiates two possible functions the state may have in the industrial policy: implementation and legitimation. Implementation implies a hierarchical relationship with industry: the state makes decisions that influence the direction of change in society. From the implementation perspective, the industrial policy aims to intervene in an industrial system more or less actively. There are three types of *implementation policy*, based on its aims (Brunsson, 2007, p. 97):

1. *Problem-solving* (state defines a problem in the industrial system and solves it with policy);
2. *Contro*l (state does not act to solve a problem, but may take the initiative and control what happens);
3. *Support* (state may support particular actions but does not aim to control them or solve problems).

A *legitimation policy* aims to create legitimacy for the political system itself, getting it *directly* through reflecting present interests in the organisational structure or *indirectly* (Brunsson, 2007). *Indirect legitimation* may relate to *responsibility* or be *situational* (Brunsson, 2007). In the first case, the state is responsible for nearly everything, thus delegating responsibility to the industry endangers legitimacy unless the latter enjoys high legitimacy itself. *Situational legitimation* occurs when the state aims to influence people's ideas about the industrial situation by solving the relevant problems without active intervention in the industrial system.

A more detailed view of the roles in the policy process provides extant literature on governance. *Governance* represents four *activities* (Pierre & Peters, 2005, pp. 3-5):

- *Articulating* collective priorities for the public. It assumes a mechanism for a consensus or a majority decision based on legitimate institutions that mediate the process.
- *Coherence*. It implies that goals are consistent and coordinated across different policy areas.
- *Steering* towards implementing the goals with a variety of instruments.
- *Accountability*. Challenging when non-government actors are involved and deliver a significant part, e.g., markets usually are not accountable.

Table 9 summarises the core building blocks of governance: actors, process, and outcomes. Despite the division of actors into government and society representing groups, the picture is more complex because neither group is a single entity (Pierre & Peters, 2005).

Table 9 – Building blocks of governance

Actors	**Process**	**Outcomes**
Government (different levels and pillars, e.g., represented by ministries) ***Society*** (different interest groups)	***Goal selection*** ("what the society wants"; government has the legitimacy to perform this part); ***Decision making*** (selection of instruments and action to reach the goals; the private sector may provide input); ***Resource mobilisation*** (also non-financial, e.g., personnel or legitimacy); ***Instruments/implementation*** (depends on private actors; the involvement of actors in decision making might help); ***Feedback*** (evaluation of actions and instruments; informing the decision-making process or adjusting the goals).	***Coherence*** (of policies, policy goals, and instruments); ***Inclusiveness*** (state and society take part and represent different interests); ***Adaptability*** (ability to change policy approaches in response to changing environment); ***Accountability*** (involves public and private actors; connects to the feedback process).

Source: own compilation from Pierre & Peters, 2005.

2.2.3.2. Governance structures

The governance structure for inclusive policy-making includes state and other stakeholders, reflecting governance capacities that rely upon two dimensions (Pierre & Peters, 2005):

1. Government authority, reflecting its power to set objectives and implement policies to benefit a broad range of societal actors;
2. Government's ability to collect the relevant information needed to inform policy.

Pierre and Peters (2005) distinguish five ideal-type models that build a continuum across these dimensions, capturing governance characteristics in different countries worldwide. Table 10 summarises the core characteristics of the five ideal type governance models.

Table 10 – Ideal-type governance models

Governance model: ***étatiste***	
Dominant actor	State, little involvement of other actors. Interactions with society as a source of legitimacy.
Process	1 State defines goals (with limited ability to correct wrong decisions because of inadequate access to social intelligence and limited capacity to process information); 2 Technocratic decision making (analysis-based; dominated by a political elite); 3 State is a major resource-mobilising actor (may function as an entrepreneur); 4 State takes responsibility for implementation (uses the limited scope of predominately coercive instruments); 5 Assumption "state knows best" (extensive state structures may provide some feedback).
Outcomes	1 Incoherence because of a division across functional lines and policy sectors (fights between different elites and organisations); 2 Unfavourable attitude towards inclusion of societal actors (state allows particular groups' participation because of strategic interests); 3 Limited adaptability (insufficient feedback from society and lacking social linkages); 4 Internally organised accountability (state has own organisations that evaluate actions).
	Governance model: ***the liberal-democratic state***
Dominant actor	Asymmetric cooperation. The state dominates, but other actors organise societal interests and compete to influence the state. A symbiosis between particular state organisations and society actors exists.
Process	1 State dominates goal setting (different state organisations compete, representing the interests of societal actors linked to them); 2 Internal state politics affects decision making (competition for resources; almost every present interest group receives some benefits); 3 Resource distribution mimics the decision making (Various segments of society finance the state and expect benefits); 4 Societal actors implement policy (least coercive instruments are used); 5 Fragmented and biased feedback from society (actors use it to advance their interests).
Outcomes	1 Lack of coherence and coordination (outcome represents the power of separate political groups; consent above coherence); 2 Selective inclusiveness (state actors control decisions); 3 Lowest adaptability potential (state loses adaptability because it opens up, and societal actors lack the autonomy to adapt; adaptability varies across policy areas); 4 Multiple accountability channels (not clear who is accountable for what).
	The state-centric governance model
Dominant actor	The state is a central actor, but institutionalised rules for participation exist. Organised interests represent society.
Process	1 State plays a crucial role in selecting the goals (with input from other actors); 2 Decision making involves other actors (primarily concerning means of achieving goals than the goals themselves; negotiation occurs between different interest groups); 3 Distributive resource mobilisation (fragmented state); 4 Smooth and efficient implementation through organised interests (they contributed earlier in the process and could resolve emerging dissonances beforehand); 5 Possibly biased feedback (towards organised interests, competing to provide it).
Outcomes	1 Better horizontal and vertical coherence (interest groups develop extensive policy expertise); 2 Selective and indirect inclusiveness (state includes peak organisations representing larger interest groups; organised interests cannot easily oppose the decisions if they contributed); 3 Hampered adaptability (change implies that some groups of organised interests will lose); 4 Organised interests influence decisions, but the state holds accountability (strengthening the state's bargaining power).

	The Dutch governance school
Dominant actor	State steers at a distance and provides legitimacy to the process.
Process	1 The state controls goal selection (other actors decide on the attainment); 2 Informal and emergent decision making; 3 State and society have strong capacities in resource mobilisation;. 4 Implementation and decision-making co-occur through cooperative arrangements (between government and society actors); 5 Possibly weak feedback (government is "steering at distance" and other actors may have no interest in providing feedback).
Outcomes	1 Coherence at the level of projects or specific policy sector (problematic for across sectors because of weak centre); 2 High inclusion (unorganised groups or those outside the network may be excluded); 3 High adaptability (ad hoc implementation and flexibility at the operational level; sufficient continuity at the higher organisational level); 4 Institutionalised means of accountability (e.g., performance management).
	"Governance without government"
Dominant actor	Governance through inter-organisational, self-organising networks; Government plays a minor role.
	1 Networks set the goals (pursuing own interests); 2 Informal decision making (by consensus); 3 Resource mobilisation from the state (to a lesser extent from the network); 4 Implementation through networks (smooth only for policies, aligned with networks' objectives); 5 Possibly biased feedback (towards networks' interests if different networks compete).
Outcomes	1 Coherence within individual sectors (lack of coherence across sectors may lead to fragmentation of the state); 2 Lacking inclusiveness (restricted access to a network, causing a lack of fundamental debates); 3 Adaptability varies (networks either induce or impede it, depending on whether networks' goals agree with political objectives; 4 Complex accountability (assessment involves elected officials and not the real decision-makers).

Source: own compilation from Pierre & Peters, 2005.

In line with the view of governance as involving two main types of actors (state and other stakeholders), research suggests that emerging industries are more likely to receive policy support when (Georgallis, Dowell & Durand, 2019):

- They have sufficient power to influence policy-making;
- There are social movements that frame industry as a solution to particular problems;
- Regulations exist that aim to create particular industries.

Regulatory support is also more likely when (Georgallis et al., 2019):

- Participants form a coherent group;
- The new industry emerges where the substantial incumbent sector is already present;
- The emergent industry balances the incumbent industry.

These notions support the assumption that critical mass must be reached within a priority domain if the priority has to evolve successfully and spurt industrial structure's renewal. Thus, EDP does not imply a simple survey of actors based on triple or quadruple helices but should create a dialogue in a participative leadership process (Kyriakou, 2016). However, descriptions of EDP provide hardly any specific suggestions on how to approach it. As Foray notes about smart specialisation: "its initial formulation left considerable latitude for policy-makers to interpret the specific content and implications of its prescriptions in any particular set of circumstances, have generated a proliferation of ideas as to what 'smart specialisation' means for economic development and growth policies" (Foray, 2016b, p. 17).

2.2.3.3. Stakeholder involvement and participation

As Cornwall (2008) notes, participation may refer to anything involving people, and the term's meaning may vary among different groups of actors. Although typologies represent well the breadth of participatory approaches, they are often normative, arranged like a ladder, showing movement upwards from "bad" approaches with little participation towards "good" ones, characterised by higher degrees of empowerment (Cornwall, 2008). Most influential typologies have been developed by Arnstein (1969), Pretty (1995) and White (1996). In Arnstein's opinion, a difference between empowerment and a simple ritual of participation lies in distributing power between different groups. To sum up Pretty's argument, the approaches to participation closer to the interactive end of the spectrum are more likely to be effective and have a lasting impact. White (1996) suggests looking at participation from two perspectives: participative process design and participation itself. Based on these perspectives, he distinguishes between *nominal*, *instrumental*, *representative*, and *transformative* participation that serve different functions.

Quick and Feldman (2011) advance the discussion and distinguish between inclusion and participation in community engagement. As Quick and Feldman (2011, p. 272) state: "Participation practices entail efforts to increase public input-oriented primarily to the content of programs and policies. Inclusion practices entail continuously creating a community involved in co-producing processes, policies, and programs for defining and addressing public issues." Thus, public acceptance for decisions increases with more inclusion, while broad participation alone does not ensure sufficient acceptance levels and can even create fatigue and participation burn-out (Quick & Feldman, 2011). As reasons for this, Quick and Feldman (2011) name distinctive features of

inclusive processes, such as engaging diverse ways of knowing, co-producing process and content, and temporal openness.

However, more participative and inclusive solutions do not automatically lead to better outcomes, and consultation may work better than approaches classified on the higher rungs of the ladder (Reed et al., 2018). Reed and others (2018) argue that bottom-up processes are not necessarily deliberative or co-productive, as extant ladder-type typologies imply, and propose a more differentiated view, the *wheel of participation*. This view suggests that either communication, consultation, deliberation, or co-production may occur equally well in a bottom-up or a top-down manner. According to Reed et al. (2018, pp. 13-14), four factors determine the outcome of engagement processes:

1. *Context* (socioeconomic, cultural, institutional);
2. *Process design* (hierarchical design and limited or ad hoc representation are less likely to deliver expected outcomes);
3. *Power* (the process is more likely to fail when some participants cannot contribute their knowledge or influence outcomes);
4. *Scalar fit* (early and well-matched to the temporal and spatial scale engagement process is more likely to result in desired outcomes).

Cornwall (2008) speaks of *invited participation* and *invited spaces* when a state or other external actors orchestrate participation. According to Cornwall (2008), networks or spaces created independently differ from *invited spaces* because people who come together on their own have something in common and are not merely stakeholders standing for different views. Previous negative experiences and a lack of belief that participation will bear tangible results may cause *self-exclusion* (Cornwall, 2008). Summarising Cornwall (2008), when designing participation, the questions to answer might be who takes part in what, for what purpose and who is absent, hence considering an optimal balance between inclusion/exclusion and level of involvement.

From the instrumental perspective, participation is primarily a means to improve the outcomes of the decision process, while from the participatory perspective, it aims to foster engagement through democratic processes (Eckerd & Heidelberg, 2020). According to Eckerd and Heidelberg (2020), public administration may combine both perspectives in the relationship with stakeholders, accounting for them with varying degrees. It results in four participation frames, as listed in Table 11.

Table 11 – Frames of Participation

		Participatory perspective: High	Participatory perspective: Low
Instrumental perspective	High	Public as partner	Public as informational resource
	Low	Public as student	Public as a hurdle

Source: Eckerd & Heidelberg, 2020, p. 140.

When stakeholders are actively involved in the decision-making process, participation is also congruent with the definition of *collaborative governance*, which is:

> *"a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets"* (Ansell & Gash, 2008, p. 544).

An iterative, collaborative process emerges from starting conditions, institutional design, and facilitative leadership (Ansell & Gash, 2008). Summing up the literature reviewed by Ansell and Gash (2008), stakeholders will be likely to participate if:

1. They feel their efforts may have a tangible outcome;
2. Stakeholders are interdependent;
3. There are highly limited alternative venues to the participative forum that enable them getting own interests on the agenda.

Prehistory of distrust and unfavourable stereotypes among different stakeholders may also inhibit the willingness to participate (Ansell & Gash, 2008). The relationship between trust, conflict, and willingness to participate may be more complex and depend upon interdependence within a group of stakeholders and between the groups (Ansell & Gash, 2008). Therefore, less favourable starting conditions may require extra leadership and better *institutional design* to outweigh these disadvantages. Institutional design serves the collaborative process's procedural legitimacy and defines the rules (Ansell & Gash, 2008). Foray (2015) notes that EDP is an iterative process, which is congruent with the findings of Ansell and Gash (2008), who see the collaborative process as highly cyclical and not staged.

2.2.4. Summary

The subchapter discussed innovation policy and S3 through the lens of neo-institutional theory. Firstly, it outlined the evolution of innovation policy rationales and positioned S3 within this research. Secondly, it also discussed the concepts relevant for the conceptualisation of the organisational field in the context of innovation policy. Thus, the subchapter elaborated on the innovation system approaches as relevant dimensions that might determine field boundaries in the context of S3. It showed how place-specific and industry-specific contexts might determine a unique configuration for S3 across states and regions.

The subchapter also addressed the issues that result from inclusive and participative policy-making, especially relevant for S3. It outlined how actors may struggle with divergent institutional logic. Besides, it reviewed the possible governance arrangements that structure the interaction between policy-makers (state) and stakeholders (social actors). Further, it introduced various participative approaches and clarified how variable understanding of the same concept might determine practical approaches.

Summing up, S3 developed from the systemic policy approaches that are well-elaborated in the academic community but still insufficiently implemented in practice. These approaches build upon system failure rationale. The logic of intervention is that policy should aim to correct innovation system failures. However, extant research conceptualised innovation system boundaries differently: based on place (national state, region) or industry perspective (technology, sector). Recently, scholars recognised that combining both views is beneficial, which also aligns with S3 logic. Another aspect of S3 is that it belongs to the inclusive and participative policy-making approaches, expressed through EDP being paramount throughout the strategy process. However, there are many challenges in pursuing inclusive and participative policy-making. These stem from the divergence between state and other stakeholders in their goals and institutional logic. There are different modes of interaction between these actors when pursuing innovation policy, resulting in different governance models. Thus, the established governance configuration might depend on how inclusion and participation occur.

3. Smart specialisation context overview

The chapter provides a context for own research, which focuses on the institutionalisation of the S3 approach in Poland and Lithuania. Systematic literature review on S3 should bridge the theoretical and empirical parts of the study. The review shapes contextual ground for Poland's and Lithuania's cases and seeks to identify factors that have affected the perceived success or failure of S3 in European regions. The chapter includes two subchapters, respectively addressing international and national S3 context.

Subchapter 3.1 presents an overview of the initial assumptions of S3 as defined in the *RIS3 Guide* and *S3 implementation handbook*. It also discusses how S3 has been approached across the EU, focusing on governance, strategy analytic, and execution processes. Further, the subchapter distinguishes what types of challenges regions face and what effects of S3 might be expected. The subchapter includes five sections. The first section is based on two guides mentioned above and other relevant literature, while the following three sections contain a systematic literature review. The fifth section provides a summary.

Assessing institutionalisation of the S3 approach in Lithuania and Poland also requires addressing several aspects that help evaluate the national S3 context. Subchapter 3.2 focuses on the national S3 context in Poland and Lithuania. It contains four sections. Firstly, it is critical to know what characterises the S3 environment in these countries. Therefore, the first section provides a brief review of previous approaches. It is also helpful to review systematically how the six steps and thematic issues of S3 have been addressed, based on the visible outcomes as extant documents, reports, and analyses. Hence, the second section includes a comparative overview of Lithuania and Poland, following the six-step structure of the RIS3 Guide. The third section summarises how Lithuania and Poland addressed the thematic S3 issues mentioned in the RIS3 Guide, completing the picture. The fourth section summarises the subchapter. The subchapter, discussing national context, is entirely based on analysing documents, reports and other secondary data sources.

3.1. International smart specialisation context

The literature review in this subchapter includes the most important publications, such as the RIS3 Guide, S3 implementation handbook, and other systematically searched and reviewed sources. The literature search in the Scopus database has been limited to title, abstract or keywords, applying further restrictions to subject areas, such as social sciences, business and management administration, economics, econometric and finance, and decision sciences. A similar procedure has been applied to the search with the Web of Science. The search for the keywords "smart specialisation" has been conducted within the topic. Both searches accounted for different spelling. After results from both databases had been checked for duplicates, the initial pool of 644 articles remained. A detailed description of the search and selection procedure provides Appendix 1.

The articles for the analysis have been selected based on the following criteria:

1. Referring to the EDP and S3 issues in at least one specific region;
2. Discuss related issues acknowledging regional context;
3. Reflect on possible challenges for the smart specialisation agenda concerning EDP or bottom-up policy approach.
4. Selected publications had to meet at least one of the criteria mentioned above and additionally meet quality criteria (as specified in Appendix 1).

It led to an initial sample of 55 cases, presented in Appendix 1, Table 3. The search has also been extended to other sources, like Google Scholar, books, and cross-references.

3.1.1. Smart specialisation guidelines

The section discusses S3 guidelines and their potential to trigger S3 institutionalisation across regions by enhancing the development of the supporting structures. Most elaborated guidelines for S3, known as six steps approach, provides the RIS3 Guide (European Commission, 2012). Besides, the RIS3 Guide includes 12 thematic issues to be considered during S3. These are summarised in Table 12.

Table 12 – Six steps of S3 and thematic issues

Six steps of S3	12 thematic issues of S3
1 Analysis of the regional context and potential for innovation 2 Governance: ensuring participation and ownership 3 Elaboration of an overall vision for the future of the region 4 Identification of priorities 5 Definition of a coherent policy mix, roadmaps and action plan 6 Integration of monitoring and evaluation mechanisms	1 Clusters and smart specialisation 2 Innovation friendly business environments for SMEs 3 Research infrastructures, centres of competence and science parks 4 Universities and RTOs 5 Digital Agenda for Europe 6 Key enabling technologies 7 Cultural and creative industries 8 Internationalisation 9 Financial engineering instruments 10 Innovative public procurement 11 Green growth 12 Social innovation

Source: own compilation from European Commission, 2012.

Additional guidelines for S3 implementation are available in the S3 implementation handbook (see: Gianelle et al., 2016).

3.1.1.1. Analysis of the regional context

Analysing regional innovation potential had a significant role from the beginning of the approach characterised as regional innovation strategies. However, introducing smart specialisation also implies prioritising specific niches and exploiting related variety. Therefore, RIS3 Guide advocates the use of various analytic approaches and mentions several methods (European Commission, 2012, pp.: 29-33):

- Analysis of (matching) Scientific and Technological specialisation;.
- Analysis of regional economic specialisation;
- Cluster in-depth case studies and peer reviews;
- Foresight.

Researchers developed different tools and methods to support stakeholders in their search for S3 priority domains. Many of these studies focused on quantitative approaches. Notably, scholars looked at the regions' specialisation based on their trade flows and network centrality in the European single market (Gianelle et al., 2014), changes in employment share within economic sectors (Markowska, Kusterka-Jefmańska & Jefmański, 2016) or the investment data of individual firms (Roe & Potts, 2016). Suggested approaches also include revealing technological specialisation

based on the patent portfolio (Kogler, Heimeriks & Leydesdorff, 2018) or analysis of specialisation patterns based on scientific knowledge production and bibliometric analysis (Heimeriks & Balland, 2016; Fellnhofer, 2018; Zacca-González, Chinchilla-Rodríguez & Vargas-Quesada, 2018; Heimeriks et al., 2019). Kotnik and Petrin (2017) developed an evidence-based method based on analysis of already available statistical data to support the prioritisation process, acknowledging governance challenges in the new EU member states. Though, this approach does not help to recognise emerging industries (Kotnik & Petrin, 2017). Researchers also developed methods for identifying regions suitable for investment in restructuring particular economic domains based on firm-linked trade and employment data (Capasso et al., 2019).

Researchers also suggested methodologies that should assist policy-makers during analyses and decision-making. These include foresight-based approaches (Tiits & Kalvet, 2013; Gheorghiu, Andreescu & Curaj, 2016), use of online mechanisms to enhance stakeholder engagement in EDP (Fellnhofer, 2017), or triple helix based connectivity analysis (Virkkala, Mäenpää & Mariussen, 2017). Researchers have also accounted for specific contexts, such as small economies (Tiits & Kalvet, 2013), sparsely populated regions (Dubois, Kristensen & Teräs, 2017) or lagging regions (Krammer, 2017). Few studies focused on the diversity of innovation systems in connection with its implications for S3. Thus, Grillitsch and Asheim (2018) proposed a framework for accounting for diversification into more complex economic activities relating to place-specific factors. Asheim (2019) also discussed new path development as a means for less innovative regions.

3.1.1.2. Governance

RIS3 Guide calls for adopting a comprehensive view of innovation and, as a result, ensuring a governance structure that includes a variety of stakeholders, beyond traditionally involved ministries and a broader range of actors than the triple helix approach implies. Following factors, crucial for S3 governance, have been identified:

1. *"The existing structures and power within and between the constellations of actors that makes up the regional quadruple helix (government, business, research and civil society)*;
2. *The strength of policy path dependency, and the existence (or not) of effective change mechanisms" (*Aranguren et al., 2019, p. 454).

Despite the importance of governance for S3, establishing an appropriate system may not be easy because specific governance arrangements may result from long-time developments and many shifts in the approaches (Rehfeld & Terstriep, 2019). Research suggests that policy learning occurs

because of interactions between different government levels in a multilevel governance process (González-López, 2019). Thus, the locus of strategising activities changes and the roles of specific stakeholders vary as the process evolves (Höglund & Linton, 2018; Kriz, Bankins & Molloy, 2018). For example, the fourth helix becomes significant as financial resources drain, and more stakeholders need to be included in the initiatives to show their ongoing relevance (Höglund & Linton, 2018). As quadruple helix members become intertwined and trust is built, unlocked power bases create readiness for change and centrality shifts towards industry and community spheres (Kriz et al., 2018).

3.1.1.3. Shared vision

According to the RIS3 Guide, developing a shared vision should keep stakeholders engaged and committed to strategy implementation. Ideally, it should represent a "dream" about the region's future but still be credible to stakeholders (European Commission, 2012). According to the RIS3 Guide, vision should be based upon scenarios, pointing direction for further development and transformation and setting the ground for priorities. Depending on regions' knowledge intensity, one of the following strategies might be adopted: building on current advantages, supporting socio-economic transformation, or catching up and creating new knowledge-based capabilities (European Commission, 2012, pp. 47-48). A further aspect to consider is the state of connectivity. Vision might also include goals, identify stakeholders and their motivation, and define communication tools.

3.1.1.4. Identification of priorities

The prioritisation process is challenging because of its complexity. If defined in line with S3, priorities should be inclusive, avoid picking-the-winners approach and sectoral prioritisation. Thus, in the initial writings, Foray (2015) explains that smart specialisation implies a shift from horizontal priorities (such as, e.g., supporting technology transfer or improving human capital) towards vertical priorities, focused on specific fields, technologies or even companies (Foray, 2015, p. 35). What these writings also emphasise is an appropriate level of *granularity* (mid-level of granularity). Neither supporting specific sectors nor the too detailed level of firms or specific technologies that would support various micro-projects is intended, which is the task fulfilled by the horizontal R&D support programmes or R&D task credit system (Foray, 2015, pp. 41-42). Therefore, the target of support and prioritisation level would be *new activities* that enable a group of firms to explore new application domains with their extant potential (which implies diversification based on related variety).

As stated in the RIS3 Guide:

> *"If the areas are presented in a too generic way, such as eco-innovation, green energy, sustainable mobility or healthcare, most regions will fail to point out their unique competitive strengths. To be credible, effective and suitable for a concrete action plan* [...]*, the priorities need to be expressed more precisely, such as ICT-based innovation for active ageing, innovative solutions to reduce city congestion, wood-based solutions for eco-construction, etc."* (European Commission, 2012, RIS3 Guide, p. 52).

Thus, an appropriate level for S3 priorities is a "mid-level of granularity" (Foray & Goenaga, 2013). However, the definition of what may be considered as mid-level of granularity is somewhat blur. As noted in one of the S3 policy briefs, defining priorities at this level means that:

- "new activities/projects involve groups of firms and other (research) partners;
- the aim is to explore a new domain of (technological and market) opportunities;
- there is potentially a certain weight and a high significance relative to the regional economy (in terms of the kind of structural changes it is likely to generate)" (Foray & Goenaga, 2013, p. 4).

In the context of S3, there are technological, sectoral and cross-sectional areas that vertical priorities could embrace (Online S3 Platform, n.d., "What kind of priorities", para. 2). Ideally, these could be combined to enable search by integrating or diversifying into new market areas and developing products upstream or downstream of the value chain. Priorities defined in such a way may be challenging to express in wording. However, as further noted on the *Online S3 Platform*, it is crucial that strategic documents contain a detailed description of priority, while the publicly used label may be simple for practical reasons. Considering the above, the *genuine prioritisation* in the context of S3 would imply that selected priorities:

- Involve groups of firms and other partners who could combine their knowledge (related variety principle);
- Reflect new development directions (promising future themes);
- Exploit regional potential by combining existing industries with selected technologies to achieve structural change.

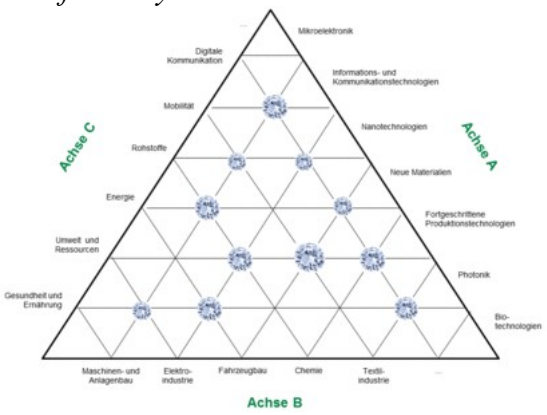
An inspiring example of the way S3 priorities might be defined can be found in the German state of Saxony, presented in Exhibit 1.

Exhibit 1 – Cross-sectional approach to prioritisation: an example from Saxony

Formulating priorities in Saxony, Germany

Saxony has chosen a cross-section approach and identified its priorities at the crossroads of promising *future themes*, key enabling technologies in which the state is strong, and traditional economic sectors. This approach resulted in the triangle scheme, where *diamonds* mark which industries could use specific KETs to address *future themes* (Illustration 1E). The approach also remained in the revised strategy, even though replacing the triangle with a more elaborate scheme (which can be found in the *Innovationsstrategie des Freistaates Sachsen (Fortschreibung)*, p. 28).

Figure 2 – *Smart specialisation of Saxony*



Source: Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr [SMWA], n.d.

Even though the triangle presented in illustration 1E could be criticised as not precise enough or a simplistic picturing of reality, it serves as a good example to enhance understanding of the prioritisation logic in S3. The example of Saxony is inspiring because of the crucial elements it contains:

- points the development directions (future themes);
- is based upon regional strengths in selected KETs (points tools available in the region for inducing change);
- addresses mid-level by pointing traditional industries (potential agents for change and market for KETs).

Source: own elaboration, based on Sächsisches Staatsministerium für Wirtschaft, Arbeit und Verkehr (SMWA), n.d.

3.1.1.5. Policy mix

Countries and regions may design their policy mix, choosing from a broad range of different instruments, depending on the objectives. RIS3 Guide provides the taxonomy of policy instruments, introduced by the OECD in 2011 in their *Regions and Innovation Policy* publication, as depicted in Table 13.

Table 13 – Classification of available instruments

	Knowledge generation	**Knowledge diffusion**	**Knowledge exploitation**
Traditional instruments	- Technology funds, R&D incentives/supports/grants; - Support to scientific research and technology centres; - Support to infrastructure development; - Human capital for S&T.	- Science Parks; - Technology Transfer Offices and schemes; - Technology brokers; - Mobility schemes, talent attraction schemes; - Innovation awards.	- Incubators; - Start-ups support innovation services (business support and coaching); - Training and awareness-raising for innovation.
Emerging instruments	- Public-private partnerships for innovation; - Research networks/poles.	- Innovation voucher; - Certifications/accreditations.	- Industrial PhDs; - Support to creativity; - Innovation benchmarking.
	- Competitiveness poles; - Competence centres; - New generation of scientific and technological parks and clusters; - Venture and seed capital; - Guarantee schemes for financing for innovation.		
Experimental instruments	- Cross-border research centres.	- Open source-Open science; - Markets for knowledge.	- Regional industrial policy; - Innovation-oriented public procurement.

Source: reprinted from OECD, 2011, p. 93; European Commission, 2012, p. 54

3.1.1.6. Monitoring and evaluation

As defined in the S3 implementation handbook:

> *"Monitoring policies and policy strategies relates to an organised 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."* (Gianelle, Kleibrink & Doussineau, 2016, p. 99).

Therefore, monitoring might be seen as a management tool to collect unique practical knowledge from the stakeholders and provide information and signals for concrete action. In line with this, it is crucial to *"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"*, which implies that every priority area has explicitly defined specific objectives and outlined expected changes (Gianelle et al., 2016, p.100). Gianelle et al. (2016) also define five indicators, which could make up the monitoring system's base (Table 14). Output and result indicators cover minimal monitoring system requirements while adding other indicators makes it more sophisticated and comprehensive.

Table 14 – Monitoring indicators

Type of indicator	Function
Output	Measuring the type and level of direct output produced by funded projects.
Result	Measuring the degree of achievement of the socio-economic objectives of the strategy for each of the S3 areas.
Implementation	Measuring the actual state of implementation of the policies and related actions undertaken in the territory.
Structural change & specialisation	Measuring the absolute and relative changes in the production systems comprising each of the S3 areas according to the trajectories and transitions, foreseen in each S3 priority strategy and for the whole economy and society.
Context	Providing a picture of the competitiveness of the regional economy, with particular reference to issues of R&I and the evolution of production systems at large.

Source: adapted from Gianelle et al., 2016, pp. 103-104.

Result-orientated monitoring should address the progress of two types of objectives explicitly for every priority (Gianelle et al., 2016):

1. Measuring the *direct output of projects* (project output indicators: such as patents and licences, people trained, networks established);
2. Measuring to what level *socio-economic objective*s have been achieved (result indicators: such as educational achievements, change in BERD, employment).

Selected indicators should also logically connect to the expected changes and objectives. Gianelle et al. (2016) note that the above-discussed baseline monitoring system can also be even more comprehensive when enhanced with other indicators. Thus, essential elements of the monitoring system are as follows (Marinelli, Guzzo & Gianelle, 2019, p. 33):

1. Result indicators;
2. Output indicators;
3. Defined linkages between (a) result and output indicators (b) specific objectives and priority areas.

Considering the above, up-to-date information on local developments and policy impact is crucial for planning further interventions. The primary function of monitoring within S3 is to enhance policy learning and enable the correction of actions in the process (Marinelli et al., 2019). Thus, monitoring aims to assess through constant comparison how well reality meets the set goals or, expressed specifically:

> *"The logic of intervention expresses the policy maker's expectations about the effects of the policy intervention. Monitoring then means gathering evidence from the real world, and quantifying the distance between the logic and the reality of the intervention. The essence of*

monitoring relies in this systematic comparison between expectations and what is happening in reality." (Marinelli, Guzzo & Gianelle, 2019, p. 32).

3.1.1.7. Strategy implementation

The S3 implementation handbook suggests five possible action categories that might be chosen depending on managing authorities' impact on the innovation field and the range of policy portfolio (Mieszkowski, Gómez Prieto & Nauwelaers, 2016). These are presented in Table 15.

Table 15 – Action categories for S3 implementation

Category	Definition	Core idea	Condition to be met
Launching strategic initiatives	Actions, gathering a broad range of quadruple helix actors in the selected priority domain.	Serve as a framework for smaller projects (pilots) that are linked together.	Need embedded learning mechanisms from the beginning.
Re-orienting existing programmes	Add S3 a criterion to comprehensive programmes.	Channel existing programmes towards selected priorities.	Priorities need to define the precise direction of development.
Changing strategic agendas from existing operators	Align strategic agendas of key players with regional priorities.	Search for synergies and complementarities between agendas of key players.	Refocusing activities and, e.g., programmes of HEIs towards S3 domains implies there is the power to do so.
Aligning infrastructure	Promote funding of infrastructure, which supports S3.	Using S3 as a legitimation of decisions against particular interests.	It might be inefficient if selected priorities encounter other obstacles than lacking infrastructure (e.g., organising or deepening collaboration).
Setting up S3 fora	Creating platforms that support national and international actors to develop shared ideas and implement joint investments within S3 priority domains.	Ensure continuous EDP and enhance international collaboration within S3 domains.	It may require strong leadership skills (available, e.g., within mature clusters).

Source: own elaboration, based on Mieszkowski, Gómez Prieto & Nauwelaers, 2016.

S3 implementation handbook notes that successful transition from priorities to projects might occur if priorities are not too broadly defined and resources are not scattered. Policy-makers are also advised to check if public support is essential or projects are so promising and bear low investment risk that they are attractive for private capital (Mieszkowski, Gómez Prieto & Nauwelaers, 2016). S3 implementation handbook distinguishes several good practices of the project selection process (Mieszkowski, Gómez Prieto & Nauwelaers, 2016, pp.: 70-71):

1. Cooperation between S3 governing instances with OP managing authorities, to ensure that ESIF is used in line with S3;

2. Checking formal eligibility and qualitative assessment of proposals, considering their impact;
3. Incorporating external views into the assessment process (as a means against particular interests);
4. Two-stage project selection process, which allows to search potential linkages between proposals or suggest grouping them;
5. "Performance reserve" for the most effective projects and projects that might emerge later in the funding cycle;
6. "Exit strategy" for the projects that did not keep up with the expectations, to ensure the funds are not unnecessarily scattered;

Relevant selection criteria for projects while implementing S3 (Mieszkowski, Gómez Prieto & Nauwelaers, 2016, p. 73):

1. *Alignment with S3* (integrating S3 objectives into project objectives and ensuring projects' contribution to S3 priority domains);
2. *Regional dimension* (benefits for the region, the potential for spillovers through scaling-up and capitalisation on project results, relevance for the broad community of regional actors and their involvement, as well as synergies with other projects or initiatives in the region);
3. *International dimension* (positioning projects in the value-chains, developing the capacity to connect projects with external inputs, and intensity of external cooperation);
4. *Viability-sustainability* (financial and legal viability, private co-funding, congruence with national orientation and setting clear targets and ensuring follow-up process);
5. *Articulation of* different available public and private *funding sources*.

The actors identified in the implementation process are (Mieszkowski, Gómez Prieto & Nauwelaers, 2016, pp. 74-75):

- Implementing bodies;
- Managing authorities;
- Evaluators;
- Stakeholders involved in EDP.

With S3, the following conclusions and challenges emerge for strategy implementation and projects selection (Mieszkowski, Gómez Prieto & Nauwelaers, 2016, p. 76):

- *Integrating S3* into local *Research, Technology, Development & Innovation* policies and gaining support from complementary instruments, not solely relying on ESIF funding;
- *Continuous EDP*, monitoring and evaluation, including stakeholders' feedback on the selection process;
- *Avoiding scattering funding* across sub-critical size projects, but considering the potential for spillovers and impact on different aspects of regional development (e.g., job creation, innovativeness);
- *Information* both from the *"included"* and *"excluded" actors/stakeholders* as part of the monitoring and evaluation process (might be helpful when revising current choices).

A good example of addressing implementation may serve S3 of the Helsinki-Uusimaa region, which has already been credited by other researchers (see: Roman & Nyberg, 2017). According to Roman and Nyberg (2017), the region aims to develop regional innovation ecosystems. Its strategic document points out key industries (spearheads) and technologies that might be deployed to renew them and, on the implementation side, the change that should be enacted (see: Helsinki-Uusimaa Regional Council, 2015). As noted in the document (Helsinki-Uusimaa Regional Council, 2015), the region plans to bring different actors together on designated innovation platforms, awaiting that actors have shared interests, and establish cooperation, resulting in new projects, pilots and demo cases. The adopted „co-creation" approach is rooted in innovation ecosystems' theoretical concept, introduced by Moore (1996), which emphasises anchor organisations that are a source of leadership for other players and support their activities. In Helsinki-Uusimaa, each priority includes related portfolios of themes. The strategic document explains how ecosystem facilitation and orchestration can be organised to ensure implementation through innovation platforms. An important lesson for other regions from this case might be that policy-makers recognise that separate organisations often cannot efficiently manage inter-organisational work on innovation, diminishing potential results.

3.1.2. Implementing smart specialisation across Europe

Given different regional contexts and capacities, one could also expect that S3 may differ in its process quality and outcomes. Therefore, necessary innovation potential must be created through different sectors, entrepreneurial culture, and a critical mass of human capital for smart diversification to work (Capello & Kroll, 2016). As further stated, this is not the case in the regions that are regarded as backward. Thus, the first evaluation results have shown that the S3 process has not run as smoothly as desired (Capello & Kroll, 2016).

Kroll (2019a) suggests measures of consistency and coherence[3] to assess S3 across regions. According to Kroll (2019a), consistency refers to the lack of contradictions in manifesting the process across the levels of strategy, priorities, and policy mix. In contrast, coherence refers to the consequential translation process: challenges into strategy, strategy into priorities, and priorities into measures that allow policy-makers to consolidate the support. Strategies across regions better address coherence than consistency and score best at the level of priorities and worse at the strategy and policy-mix levels (Kroll, 2019a).

Hence, initially, Kroll (2015) divided European regions into three types, depending on their institutional structure and governance capability to implement EDP (Kroll, 2015, pp. 2094-2095): (1) regions with centralist planning cultures and governance, spending the most time on preparing the ground for EDP implementation (predominately in *Eastern Europe*); (2) regions with little bottom-up governance routines, but favourable institutional context, which could implement EDP more easily after adjusting governance (predominately in *Southern Europe*); (3) regions with strong strategy-building capabilities and favourable institutional framework, able to implement EDP easily and serve as an excellent example (predominately *Central* and *Northern Europe*). However, a later study suggests that such division is rather simplistic, as the relationship between the region's geographical location and consistency and coherence of S3 is lacking (Kroll, 2019a). Analyses conducted at the finer-grained geographical level suggest variable results within the same country (Bačić & Aralica, 2017; Dziemianowicz & Bil, 2017; Kroll et al., 2016) or between national and regional levels (Healy, 2016).

Thus, this section aims to answer the question:

What factors might affect the S3 context and approach to EDP in European regions?

3.1.2.1. Governance structure and policy capacity

Some regions perceived their strategies as well-tailored to their context and goals and were reluctant to replace them with the S3 approach, especially from the countries that are less dependent on structural funding or have long traditions in pursuing innovation policy, such as the UK (Peck et al., 2013; Marlow & Richardson, 2016; Pugh, 2014; Pugh, 2018) or Germany (Kroll et al., 2016; Vlčková, Kaspříková & Vlčková, 2018). However, a decentralised and localised approach, implied

3 Kroll defines coherence and consistency based on Rogge and Reichardt (2016, *Policy mixes for sustainability transitions: An extended concept and framework for analysis*)

by the notion of "tailor-made" policy solutions characterising S3, does not necessarily distinguish their strategies. Thus, attempts to continue a previous policy approach, simultaneously attempting to align it with S3 requirements, led to the mistranslation of S3 and the "cherry-picking" of some aspects in the UK (Pugh, 2018). Other regions that treated S3 superficially, already experienced growing levels of specialisation over the last decades, as shows the German example (Vlčková, Kaspříková & Vlčková, 2018). Hence, as in Thuringia, S3 could be successfully implemented and expressed a high level of coherence, despite shortcomings in the selected domains' consistency (Kroll, 2019b).

Another group of regions approached S3 rigorously and initialised exercise, which often followed a similar design. Regions and countries with seemingly different contextual backgrounds applied foresight-based, staged EDP approaches to priority definition. Regions and countries with seemingly different contextual backgrounds applied foresight-based, staged EDP approaches to priority definition, including Lithuania (Paliokaite, Martinaitis & Reimeris, 2015), *Romania* (Gheorghiu, Andreescu & Curaj, 2016), Eastern Macedonia and Thrace (Santini et al., 2016), Tuscany (Fabbri, 2016), Malta (Georghiou et al., 2014). The pressure to develop S3 quickly possibly affected the outcome of these approaches (Paliokaite et al., 2015; Gheorghiu et al., 2016). However, Russia's example, described by Kutsenko, Islankina and Kindras (2018), shows that shortcomings might also emerge even if there was a possibility of developing S3 without time pressure, allowing more elaborated processes at distinct steps.

One explanation for the sub-optimal process could be insufficient guidelines. Thus, S3 guidelines are vague when specifying what factors of innovation system approach to include into strategy (e.g., economic, social, cultural), which results in operationalisation difficulties (Pugh, 2018). Although policy-makers in the regions where participative EDP was a novelty could have benefited from more details, such step-by-step guidelines would be inappropriate due to varying local contexts. Hence, it was reasonable to leave freedom for the policy-makers to develop their approaches (Kroll, 2019a). Indeed, despite the vaguely defined concept of "domain" in S3, some regions could address its implications in their innovation strategies adequately (Mäenpää & Teräs, 2018). However, other studies show that policy-makers often understand the implications of S3 but cannot translate them into practice, as with a progressive view of monitoring's role (Kleibrink, Gianelle & Doussineau, 2016) or S3 outward dimension (Uyarra, Marzocchi & Sorvik, 2018).

Notably, initiatives before S3, congruent with the EDP assumptions, could be found in different national contexts, such as Germany (Clar & Sautter, 2014) or Poland (Mieszkowski & Kardas, 2015). Thus, in Baden-Württemberg, stakeholders could jointly develop priorities for the long term and commit resources for related investments, regardless of public support (Clar & Sautter, 2014). In Poland, successful bottom-up processes emerged as entrepreneurial initiatives, while the state-initiated programmes did not yield comparable results (Mieszkowski & Kardas, 2015). These examples confirm the importance of stakeholders' commitment and process coordination. Researchers emphasise the context-sensitivity of such processes and highlight the importance of territorial and sectoral conditions (Clar & Sautter, 2014).

In collaborative, open innovation networks, it is crucial to balance the democratic needs of the involved organisations and bureaucratic rules, ensuring network stability (Gadille & Siarheyeva, 2014). Gadille and Siarheyeva (2014) stress the importance of professional animators acting as catalysts for innovative ideas emerging from the grassroots. A similar role might perform intermediary organisations, connecting quadruple helix actors in the peripheral regions and fostering innovativeness (Nordberg, 2015). Nordberg (2015) also notes the importance of the employees' mobility and interdisciplinary background in such an organisation, resulting in an inability to transfer knowledge between different industries and industry and knowledge institutions.

Summing up, governance system characteristics may be a source of regional differences in EDP. Thus, an appropriate governance system might foster development in line with S3, despite deficits in the official strategy development process. Smart specialisation might develop even without the targeted support of the policy-makers, as Foray (2015) observed. Moreover, policy-makers might not have sufficient capacity to identify these structures. Because governance is a crucial but challenging aspect of S3, it became a subject for further research. In sum, extant research suggests that governance arrangements are path-dependent and develop in an evolutionary process (Capello & Lenzi, 2016; Höglund & Linton, 2018; Karo & Kattel, 2015; Kriz, Bankins & Molloy, 2018; Rehfeld & Terstriep, 2019). Possibly, the S3 exercise may also trigger further developments in governance.

3.1.2.2. Priorities and their implementation

Analysis of smart specialisations in Poland and Italy shows that most priorities are defined in a nested, tree-like mode, and most of them are in line with S3 logic as they address at least two dimensions out of four (Gianelle, Guzzo & Mieszkowski, 2019b, p. 1381):

1. The sectors or value chains of primary interest for the intervention;
2. The transformative processes to be activated (technology applications);
3. The societal challenges to be addressed;
4. Natural, cultural, or both types of resources to be used.

Research shows that selected priorities do not automatically reflect stakeholders' views or specific potential of the regions (Lopes et al., 2018b; Bański & Mazurek, 2018) or are in line with scientific activities (McMillan, Bezzina & Casey, 2016). Regions also not always chose specialisations reflecting their actual strengths, as revealed by patenting activities (Klincewicz, 2018; D'Adda et al., 2019a). Some regions have indeed limited choices provided by their actual potential (Bański & Mazurek, 2018).

Another issue discussed in S3 related literature is whether priorities should be based on related variety, as the initial idea implied. Studies of Italian regions revealed that applying this principle has not necessarily been the case (Iacobucci & Guzzini, 2016; D'Adda, Iacobucci & Palloni, 2019b). Among probable causes may be difficulties in applying available scientific methodologies to the S3 and unavailability of necessary data (Iacobucci & Guzzini, 2016). The related variety approach may also clash with a requirement to reach critical mass for smart specialisation, especially in small regions (Iacobucci & Guzzini, 2016). Still, development based on path extension combined with some path modernisation elements might be an appropriate choice if there are additional barriers to new path development or importation (Květoň & Blažek, 2018).

Notably, the strategic policy-making agenda evolves at three levels: overall strategy development (strategic level), priority-setting (priorities), and decision on implementation, including measures and actions (policy-mix) (Kroll, 2019a). Notwithstanding, some regions focused on priority setting and neglected two other dimensions (Kroll, 2019a). It could also be observed in the outcomes. Thus, regions adopted a tailor-made approach to prioritisation and chose distinct patterns within the same generic themes (McCann & Ortega-Argilés, 2016b; Serbanica & Constantin, 2017). However, S3 principles are less influential in designing operational programmes (McCann & Ortega-Argilés,

2016b). As noted by Todeva and Ketikidis (2017, p. 62), public authorities should have an overview of the structural composition of the priority sectors and determine relevant actors to ensure successful intervention, which is challenging. Yet, integrating different strategy components might be crucial for S3 to succeed.

3.1.3. Challenges for smart specialisation

The current section reviews the challenges that regions face when developing and implementing S3. Therefore, it aims to answer the following question:

> *What challenges can be identified for the S3 approach in different types of regional innovation systems?*

The complexity of S3 causes numerous challenges stemming from different sources, which makes it difficult to address them comprehensively. It may also illustrate the comparison of S3 to a wicked game (Lundström and Mäenpää, 2017). A notable amount of literature acknowledges challenges for S3 and discusses them in different contexts. In a broader sense, these challenges explicitly or implicitly relate to different aspects of governance. Table 16 provides a sample selection of issues and challenges brought up by the existing research.

Table 16 – Selected S3 related challenges and issues

Challenges/ issues	Sample Studies
Power distribution and influence	
Centralisation-decentralisation; Coordinating multilevel governance; Managing network; Rent-seeking behaviour	McCann & Ortega-Argilés (2014); Morgan (2016); Guimón (2018); Komninos, Musyck & Reid (2014); McCann & Ortega-Argilés (2013b); Marlow & Richardson (2016).
Path dependence	
Persisting regional learning paradigms (might block EDP and lead to lock-in); Deficits in innovation system; Lock-in and hindrance to path creation or path renewal	Valdaliso et al. (2014); Capello & Lenzi (2016); Rosiello et al. (2015); Moodysson, Trippl & Zukauskaite (2017); (Oleksiuk, 2018)
Perceptions, Attitudes and Culture	
A narrow view of innovation (focus on R&D); Business culture perceived as little innovative; Negative perception towards state intervention into markets; Administrative culture intolerable to failures;	Iacobucci (2014); Georghiou et al. (2014); Paliokaite, Martinaitis & Reimeris, (2015);
Regional and sectoral (technological) dimensions of S3	
Selecting domains of a relevant size that enable diversification and interregional learning (connectedness and connectivity issues); Determining boundaries (administrative vs functional); Organising interregional collaboration;	McCann & Ortega-Argilés (2015); Capello & Kroll (2016); Uyarra, Marzocchi & Sorvik (2018); Radosevic & Ciampi-Stancova (2018); Sörvik et al., (2018)
System capacity to implement S3 (structures and process supporting activities)	
Organising and implementing EDP in line with its principles; Connectivity between innovation system actors; Absorptive capacity and networking capabilities; Actors, structures, and power relationships are path-dependent	Fabbri (2016); Morgan (2017); Oleksiuk (2018); Papamichail, Rosiello & Wield (2019); Aranguren et al. (2019)
Stakeholders- and governance-related challenges (roles, motivation, arrangements)	
Possible process traps in the context of S3, place leadership, and governance: - institutional conflict - governance - capability - mobilisation - shared vision	Sotarauta (2018)

Source: own elaboration

3.1.3.1. Power distribution and influence

Several studies mentioned centralised innovation policy as a challenge to S3 (McCann & Ortega-Argilés, 2014; Morgan, 2016; Guimón, 2018; Komninos, Musyck & Reid, 2014). Thus, it might

cause tension between central and local governments (Komninos, Musyck & Reid, 2014) and demand established coordination mechanisms (Guimón, 2018). Therefore, regions need multilevel approaches to governance to leverage competencies on different levels: the regional government may have competencies in S3, and governments at the county or metropolitan level may have better contacts with local players (Estensoro & Larrea, 2016). Implementing S3 in the complex multilevel governance system also requires aligning goals and managing relationships (Marlow & Richardson, 2016) and avoiding rent-seeking behaviour, which might challenge the fair prioritisation process (McCann & Ortega-Argilés, 2013b). Some actors may be more powerful than others and attempt to direct EDP while overwhelmed with territorial complexity towards simplification and clear structures, impeding potential discoveries (Estensoro & Larrea, 2016).

3.1.3.2. Path dependence

Among challenges for implementing S3, researchers name path dependence (Valdaliso et al., 2014) and persisting regional learning paradigms (Capello & Lenzi, 2016). These might result from an underdeveloped innovation system, characterised by a lack of entrepreneurial-minded actors, links between them, and communication channels (Rosiello et al., 2015). There might be difficulties balancing specialisation and diversification to avoid lock-in (Rosiello et al., 2015) or fostering path renewal or creation (Moodysson, Trippl & Zukauskaite, 2017).

A region might need to shift its current learning paradigm towards more advanced, to enable EDP, which implies breaking out of the following *path-dependent contexts* (Capello & Lenzi, 2016):

1. *Cognitive* (cognitive maps and shared world-views produced in collective learning and as an effect of mimetic and isomorphic behaviours);
2. *Socio-economic* (extant investments and infrastructure might become obsolete);
3. *Institutional* (extant mechanisms and institutional rules support current learning paradigm and change is costly);
4. *Relational* (implies the need to break extant networks and establish new ones).

Thus, “the jump to a new paradigm is a matter of dynamics of complex structural systems, calling for a harmonious change in all its constituent parts, from the functional to the socio-institutional and relational domains” (Capello & Lenzi, 2016, p. 1601). Consequently, the change in the regional learning paradigm may also imply reorganising the present governance system.

Regions with weak institutions may benefit from EDP when transforming existing institutions and catching up with institutionally strong regions (Benner, 2019). According to Benner (2019), this change may occur either through *upward causation* (behaviour changes institutions) or *downward causation* (rules change behaviour). Ex-ante conditionality for S3 and EDP might trigger institutional change through upward causation, helping to build trust among stakeholders (Benner, 2019). Indeed, Foray (2018b) notes that new practices and institutions have emerged in connection with S3, supporting the development of capacities at government and agency levels. However, external stimuli that emerge over decades may not suffice to trigger bottom-up actions to change path development, as shown in *Warmińsko-Mazurskie*'s case (Dziemianowicz, 2017). The neo-institutional theory plausibly explains why such a change needs much time to evolve. Thus, Henderson (2020) finds that a broad community of regional actors conducts maintenance[4] practices. These practices may be nuanced and involve an interplay of different structural factors that support durability, normative and deterrence practices, and adaptation to changing environment or external requirements.

3.1.3.3. Perceptions, attitudes and culture

The challenges, related to perceptions, attitudes and culture, may stem from the need to shift from R&D to a broader view of innovation (Iacobucci, 2014) or to change governance routines and business culture towards being more innovative (Georghiou et al., 2014; Paliokaite et al., 2015). When routines necessary to support EDP are lacking in particular regions, it may take a long time for them to emerge, and experimental learning by trial and error has to be enabled (Karo & Kattel, 2015). Hence, this type of challenge might lead to path dependence and impose hard work on policy-makers and implementing bodies for S3 to succeed.

Foresight-based approaches might contribute to the governance change in different regions, as demonstrate examples of Tuscany (Fabbri, 2016) and Lithuania (Paliokaite, Martinaitis & Sarpong, 2016). In Lithuania, the design of S3 implementation roadmaps enhanced trans-sectoral dialogue and learning and contributed to the joint ownership of the selected priorities, but *administrative and policy inertia* constituted a challenge to translate results into policy decisions on implementation (Paliokaite, Martinaitis & Sarpong, 2016).

4 As defined by Lawrence and Suddaby (2006, p.230), maintenance is part of the institutional work that aims to support, repair or recreate social mechanisms to ensure compliance.

3.1.3.4. Regional, sectoral, and technological dimensions of S3

Definition of regional boundaries based on the region's administrative boundaries might be not congruent with the essence of S3, and coordination across regional and national borders might be needed (Pugh, 2018). From the sectoral or technological innovation system perspectives, considering S3 beyond regional boundaries in some regions might be more crucial than in others.

Thus, Boschma and Gianelli (2014) underline the importance of technological relatedness and related variety for S3 success. For larger regions with higher diversification, the critical mass necessary to embrace S3 principles of embeddedness, relatedness, and connectedness is easier to reach (McCann & Ortega-Argilés, 2015). In contrast, a micro-economy such as Malta faces the challenge of reaching the critical mass necessary for opportunities between different sectors to emerge and achieve regional branching (Georghiou et al., 2014). Similarly, in sparsely populated areas with abundant natural resources, poorly developed human capital and low agglomeration economies, international collaboration and knowledge flow might influence S3 implementation (Sörvik et al., 2018).

However, interregional collaboration may be challenging because of (Uyarra, Marzocchi & Sorvik, 2018):

- The lack of political (institutional) commitment;
- Relational inertia (regions collaborate too little or search partners not necessarily based on their specialisations);
- Complex joint programming with lacking R&I instruments at the respective geographical level.

Notably, in the EU member states, joined in 2004 or later (EU13), the innovation process is highly internationalised but weakly linked (Radosevic & Ciampi-Stancova, 2018).

Challenges for exploiting related variety and branching may also stem from misinterpreting the concept of smart specialisation. Thus, smart specialisation is not about specialisation in particular sectoral domains but also implies diversification into related industries, providing new opportunities (McCann and Ortega-Argilés 2013b; Cooke, 2016). However, in different countries, understanding of S3 varies (Komninos, Musyck & Reid, 2014), sometimes impeding diversification attempts (Cooke, 2016).

3.1.3.5. System capacity, structures and activities

According to Morgan (2017), connectivity between actors is crucial for smart specialisation to generate novelty. Researchers also underline the importance of connectivity for the involvement of relevant stakeholders in EDP and S3 governance (Fabbri, 2016; Aranguren et al., 2019). In the pioneering regions, connectivity is ensured by skilled firms and sustained by well-developed regional innovation systems, while in the lagging regions, policy-makers need to enhance connectivity between relevant actors (Morgan, 2017). As Morgan puts it: "The great danger of the S3 programme as it stands is that it is perceived as a policy template, offering prescribed steps for all regions regardless of regional context" (Morgan, 2017, p. 572).

Barriers to implementing S3 may also link to absorptive capacity and networking capabilities, specifically, the absence of collaborative culture, lack of trust and varying understanding of strategic networking (Papamichail, Rosiello & Wield, 2019). Besides, less developed regions face challenges for creating new technology-based firms because of various aspects (e.g., policy, culture, knowledge institutions, industrial context, human resources and economic and financing conditions) (Naghizadeh, Allahy & Ranga, 2020). Hence, planning interventions for capacity building and long-term outcomes is crucial (Kempton, 2015). Successful building of absorptive capacity among the less innovative firms might depend upon several factors (Kempton, 2015, p. 494):

1. Evidence-based mutual understanding of regional needs and potential, enabling interventions connected to the most promising areas;
2. Building research capacity at the university around specific industry areas and their needs;
3. Creating mechanisms that foster business-science interactions and collaborations;
4. Industry actively co-shapes higher education to secure availability of the skilled employees.

As Kroll (2019a) notes, despite some studies documenting S3 in the different regions, empirical evidence explaining the failure of the S3 approach is still insufficient. Extant literature mentions (Kroll, 2019a):

1. Context and governance cultures with generic governance quality;
2. Socio-economic capacities revealed by technologically capable actors;
3. Links and level of mutual openness between these actors.

In the wake of S3 with the multi-actor strategy process, the agency's role is also increasing, and novel forms of leadership might determine policy success (Sotarauta, 2018).

3.1.3.6. Stakeholders- and governance-related challenges

Strategy development and implementation might depend on the stakeholders' roles in the governance arrangements, which may differ depending on the aims to be achieved. For example, universities may have different roles in the system and concentrate on different activities depending on the chosen path for transition (Gjelsvik, 2018) or regional development level (Vallance et al., 2018). In S3, universities may also serve as catalysts for regional development and provide research infrastructure for local businesses in the less-developed or peripheral regions (Lengyel, Lukovics & Imreh, 2016; Kempton, 2015).

Firms' motivation to cooperate also has implications for inclusive policy-making. Thus, research shows different motivations to participate in cooperative formats, such as clusters: lobbying, innovation, market and sector analyses, infrastructure and standards, network and collaborations, and training (Anić et al., 2019). These motivations vary depending on companies' characteristics, such as size, age, or industry type (e.g., mature or emerging) (Anić et al., 2019).

Another issue to be addressed in S3 is multilevel governance. According to Marinelli, Guzzo and Gianelle (2019), different government levels share responsibility for the design and implementation of S3. Priorities should be defined "at the interception of technology, industry, and societal needs" (Marinelli, Guzzo & Gianelle, 2019, p. 28). Therefore, complexity and difficulty in determining cause-outcome relationships ex-ante result in an experimental approach and iterative policy process, triggering learning. Marinelli et al. (2019) also distinguish characteristics of such a process within S3:

1. EU sets framework goals and general rules (e.g., ex-ante conditionality, like S3, to promote resource concentration);
2. National and regional governments set specific objectives in line with their own needs, congruent with the EU main objectives, and determine the means to achieve them;
3. Policy-makers revise goals, performance measures and decision-making procedures during implementation based on the evidence collected through the monitoring;
4. Mutual learning evolves via reporting to the EU authorities and peer review and experience exchange exercises.

In the context of S3 governance, it might be helpful to recall the well-known work on strategy development by Mintzberg and Waters (1985), who distinguished between deliberate and emergent

strategy components. As they explain, strategies can be realised as intended, deliberately or, despite intentions, be emergent. However, in reality, a mix of both components can be observed, suggesting several strategy types within this continuum (Mintzberg & Waters, 1985):

1. The **planned** strategy (Leaders or centre precisely formulate intentions, with many details);
2. The **entrepreneurial** strategy (Reflects intentions of a single entrepreneur, but these are not as precisely outlined as in the planned strategy. Vision provides orientation and allows some adaptability);
3. The **ideological** strategy (Intentions from a "collective mind", which implies a strong identification of the organisation's members with a collective vision and beliefs);
4. The **umbrella** strategy (Some general boundaries are defined, with the freedom to manoeuvre within them);
5. The **process** strategy (Leaders control the process of strategy development but not the content which other actors generate);
6. The **unconnected** strategies (Discrete parts of an organisation can realise their patterns deliberately, but the strategy is emergent from the perspective of the entire organisation. The organisation can approve it and integrate it into the deliberate strategy);
7. The **consensus** strategy (Develops in interaction among actors and mutual adjustment, but not from the intentions, either individual or supported by collective beliefs);
8. The **imposed** strategies (From the environment or powerful external actors).

Thus, from the multilevel governance perspective, particular types of strategies described by Mintzberg and Waters (1985) may suggest a suitable approach based on the specific strategy level under consideration.

3.1.3.7. Perception of challenges based on RIS3 Guide

From the six steps of S3, monitoring and evaluation had been perceived as most challenging while analysing the regional context and existing potential for innovation as the most straightforward (Marinelli, Guzzo & Gianelle, 2019). Notably, policy-makers expect S3 monitoring to go beyond audit and address a broad range of needs, including informing decision-making, communicating progress to the stakeholders or building trust (Kleibrink, Gianelle & Doussineau, 2016). Substantial challenges for monitoring include developing appropriate indicators and gaining access to the required data, timeliness of findings, and the time lag between actions taken and their outcomes. (Marinelli et al., 2019). The most common sources for monitoring evidence are official statistics,

indicators from operational programmes and surveys, with Horizon 2020 being more relevant at the national than at the regional level (Kleibrink, Gianelle & Doussineau, 2016). Foresight or Delphi method is much less common. Marinelli et al. (2019) note that many regions introduced stakeholders' and beneficiaries' surveys and focus group interviews as new methods with S3. However, social media channels are still rarely used compared to other methods (Marinelli et al., 2019).

3.1.4. Preliminary effects of S3

The section provides an overview of possible S3 effects, guided by the following question:

> *What effects may the S3 approach have on developing and implementing the R&I policies in European regions?*

It addresses three aspects: S3 potential to trigger policy change, indications of the possible impact on economic development, and implications of industry and technology context for S3.

3.1.4.1. Policy change

Some scholars already note a positive impact of the S3 approach in the states with centralised and little developed innovation systems, where it is strengthening links between relevant actors (Ranga, 2018) and pushing towards balancing power between regional and national authorities (Chrysomallidis & Tsakanikas, 2017). Another benefit is an altered understanding of priority and sensitivity towards prioritising (Reimeris, 2016; Chrysomallidis & Tsakanikas, 2017). However, there is a risk that systemic change will not happen, but new rules will mask the same game (Reimeris, 2016). Thus, it is unclear to what extent the change may advance in the wake of the newly imposed rules (Chrysomallidis & Tsakanikas, 2017).

Trippl, Zukauskaite and Healy (2019) summarised several factors that might determine whether the S3 approach may be adopted in the region:

- Level of decentralisation and autonomy of the regional government to decide upon innovation policy and distribution of funds;
- Institutional structures and quality of government in the region;
- Capabilities of regional actors to design and implement regional innovation strategies as S3;
- Path dependency and policy practices in the past;
- Density and degree of the specialisation of industrial structure in RIS;

- Organisational thickness or thinness of RIS;
- Internal and external connectedness;
- Institutional structures (formal and informal), related to innovation and cooperation patterns.

Borrás and Jordana (2016) note that little is known about actual policies' characteristics and evolution despite advancements in policy rationales. Thus, changing policy may also imply a different approach to evaluation. With S3 and EDP, new governance arrangements involving multiple government levels and stakeholders emerge, which calls for the policy-mix evaluation process to shift from accountability towards a strategic approach to evaluation (Magro & Wilson, 2019). Therefore, the purpose of evaluation would be strategic learning, and evaluation would function as a dialogue space between different governments, policy-makers, and stakeholders involved in S3 (Magro & Wilson, 2019).

3.1.4.2. Economic development

Even though it is still early to evaluate the economic impact of S3, it may be helpful to look at some similar initiatives. The picture is complex, and outcomes appear highly dependent on a specific constellation between local context, policy goals and choices made during policy design.

Studies find mixed effects of prioritisation on different aspects of economic development, such as investments, productivity or employment, among others (see, e.g., Crescenzi, de Blasio & Giua, 2020; Crawley and Hallowell, 2021). However, in the first case, the programme "did not embed any entrepreneurial discovery processes typical of the S3 approach" (Crescenzi, de Blasio & Giua, 2020, p. 1344.). In the second case, a comparison between S3 and the analysed similar programme shows that the latter did not involve *ground up* identification when selecting priorities (Crawley & Hallowell, 2021, p. 428). Research also indicates that specialisation might advance exports (Nazarczuk et al., 2018; Piekkola, 2018). However, the relationship to innovativeness is not that straightforward as might appear and differs depending on the level of analysis. Specialised R&D increases exports of specific industries but does not advance general innovative potential because exporting firms use services of other, less export-oriented domestic firms (Piekkola, 2018). Therefore, it might be necessary to combine broad support for innovation activity in all firms and targeted support for specialised firms or industries (Piekkola, 2018). Such an approach would imply a combination of S3 with horizontal policy.

Research also indicates that different regional contexts might demand different policy approaches in terms of appropriate support mechanisms. Thus, measures promoting research excellence or human capital development may positively affect the aggregated level when applied in the respective regional setting, which masks regional differences (Varga, 2017). Thus, S3 has a different success rate across regions regarding its impact on entrepreneurship and knowledge development (Varga et al., 2020). Varga et al. (2020) conclude that the impact of policies targeting the development of external knowledge and regional entrepreneurship depends on the interplay of different factors, among others (p. 57):

- Entrepreneurship level in the region;
- The embeddedness of the region in interregional knowledge networks;
- The magnitude of policy shocks;
- The size of R&D and human capital;
- Dynamic effects generated by the policy shocks (e.g., changes in regional production resources (labour and capital), with better access to knowledge through networks).

Therefore, combining entrepreneurship and network policies with human capital development and targeted R&D promotion is crucial for the EDP's success in lagging regions (Varga et al., 2020).

3.1.4.3. Implications for S3

In terms of labour productivity growth, economic convergence depends on the economy's structural characteristics, implying the importance of place-based and sectoral aspects of S3 for the lagging regions (Di Berardino et al., 2017). Hence, usual policy tools favour specific types of firms and sectors, suggesting a need to differentiate them based on the sectoral characteristics (Isaksen, Normann & Spilling, 2017). Besides, companies in specific regions may face notable differences in the competitive advantage (Kuleševičiute & Rybakovas, 2015; Bečić & Švarc, 2015). Thus, combining S3 and horizontal priorities could aim to align specific capacities, improve the business environment, and enhance operational processes for innovations instead of supporting the development and manufacturing of innovative products within S3 priority fields (Kuleševičiute & Rybakovas, 2015).

According to its initial assumptions, S3 underlined the importance of local potential and specialisation into related industries in line with the related variety concept. Research shows that related variety positively affects firm performance (measured as turnover per employee) in nearly all regions, except those with the diversified strong secondary sector (Nilsson, 2017). Unrelated

variety had mixed results at the local level (defined as post-code areas) and negatively affected firms' performance in urban regions, but positively in rural regions (Nilsson, 2017). Notwithstanding, lagging regions may lack the necessary knowledge to enhance their innovation performance based on local potential, and extra-regional collaborations with regions that are technologically unrelated to their specialisation may benefit them (Barzotto et al., 2019). However, as the stock of knowledge increases, cooperating with technologically similar regions or relying upon local capabilities delivers better results in innovation performance (Barzotto et al., 2019). Research also shows that the level of productivity in the regions and the ability to benefit from spillovers depend on the network relations and local knowledge base (Cortinovis & van Oort, 2019).

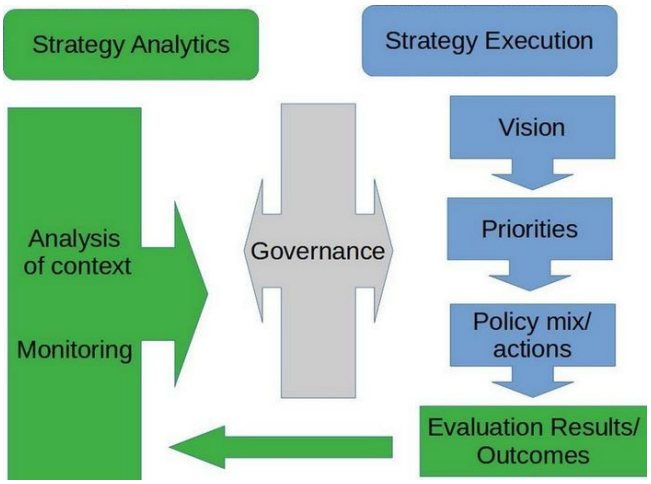
Specialisation in KET determines regional growth, especially for the less developed regions that recently increased their specialisation at the expense of the advanced regions (Evangelista, Meliciani & Vezzani, 2018). KETs might diminish the path dependence through their role in related variety and technology branching and allow for explorative diversification by recombining less related domains and developing more technological specialisations (Montresor & Quatraro, 2017). This feature of KET has positive implications for the regions to develop specialisations in line with new emerging themes by recombining knowledge through the technology hybridisation process (Montresor & Quatraro, 2019). However, despite a positive impact of KET and technological diversity on more radical innovation, EU policy instruments aiming at innovation support may foster core-periphery division (Muscio & Ciffolilli, 2018). The case study of agri-food related projects, funded by FP7, demonstrates that it promoted technological diversity in central regions and specialisation in peripheral regions (Muscio & Ciffolilli, 2018).

Worth noting that from the perspective of value creation in the innovation process, technology and engineering-based product development is just one possibility of developing a value for the market, the other being experience-based valuation and identity-based valuation (Carvalho & van Winden, 2018). Experience creates value for the market through collectively constructed "cultural and material features of the stage" instead of the technical quality of the product (Carvalho & van Winden, 2018, p. 85). Identity valuation relies on firms' ability to adapt to their customers' changing lifestyles and values, sustaining legitimacy as providers of specific products (Carvalho & van Winden, 2018).

3.1.5. Summary

Perhaps important to note that even though the six steps approach may appear staged, the steps intertwine and might co-occur and influence each other. Figure 3 summarises how the steps link to each other.

Figure 3 – Six steps for designing and updating S3



Source: own elaboration, based on European Commission, 2012.

As depicted in Figure 3, analysis of the context, (ongoing) monitoring, and evaluation represent strategy analytics. Notably, context analysis might also be included in ongoing monitoring or evaluation since this information might be relevant for updating strategy. Translating vision into priorities and actions (policy mix) represents strategy execution (including planning). *Governance* is an overarching theme related to all the other steps.

In sum, the emphasis on different contexts suggests the complexity of the S3 approach. It could make it difficult for the common standards to evolve at a highly detailed level. However, such variety is also in line with the intentions of the European Commission to develop localised policy approaches. The six-step approach represents necessary elements of the S3, leaving much freedom to choose specific tools and ways to implement the steps. Researchers also underline the role of national governments and organisational readiness at the national level to translate such complex concepts as S3 in policies and channel them to the regional level (Gebhardt & Stanovnik, 2016). Thus, policy-makers might choose what is most appropriate for a specific context.

A summary of selected S3 aspects across regions is provided in Table 17. The findings reflect S3 governance aspects (including organisation of EDP process) and characteristics of priorities. There were no sufficient studies to compare other aspects of S3, such as implementation or monitoring.

Table 17 – Summary of selected S3 aspects across regions

Aspect	**Where**	**Possible explanation**	**Obstacles**
Variability in consistency and coherence of S3	Fine-grained regional level (not only across the stereotypic east-west division, but within a country)	Governance arrangements (various deficits)	- Slow learning progress; - Persisting old institutions; - Reluctance to engage in S3 (mainly developed regions, e.g., in Germany; UK)
Priorities might not always reflect all the relevant dimensions	A mismatch between priorities and regional potential in some regions within a country, as indicated in several studies (see: D'Adda et al., 2019a; Klincewicz, 2018; Lopes et al., 2018b)	Scientifically founded explanation lacking in extant literature	- In some cases, weakly developed innovation systems; however, an elaborate explanation still lacking
	Under-explored relatedness potential (Iacobucci & Guzzini, 2016; D'Adda, Iacobucci & Palloni, 2019b)	Methodology difficult to apply	- Availability of relevant data

Source: own elaboration

S3 approach varied across regions. Some advanced regions treated the process rather superficially and did not use the chance to develop elaborated innovative strategies. Still, well-developed governance capabilities in these regions allowed them to implement their submitted strategies coherently. Other regions put much effort into developing elaborated priority trees but lacked the capabilities to translate these into a coherent policy mix. An important finding is that regional differences emerge within a particular country and do not automatically correspond with the stereotypic east-west division (e.g., concerning stakeholders' involvement or decentralised policy approach).

Initially, many regions focused firmly on defining priorities, and scholars paid much attention to the quantitative analysis methods, supporting priority definition. Policy mix, monitoring and evaluation received less attention in the extant research. So far, policy-makers across regions perceive monitoring, evaluation, and governance as the most challenging steps of S3 (Marinelli et al., 2019).

Challenges experienced by regions stem from different sources. These include governance-related challenges, specifically policy decentralisation and the establishment of multilevel governance. This type of challenge is especially profound in countries with high centralisation and weak institutions. Other challenges relate to the entrepreneurial landscape and include inadequate business cultures, lack of absorptive capacity, weakly developed networks with other stakeholders in the region or across regions.

So far, the main effect of S3 has been that it has drawn attention towards such innovation policy aspects as prioritisation, stakeholders involvement, and evidence-based policy-making. However, it is not sure whether the change initiatives triggered by S3 will be sustained. The economic impact of S3 is still not clear. However, studies show that effects may vary across regions. Studies on related variety and diversification, the concepts closely related to S3 logic, demonstrate that outcomes of these approaches vary across different settings. Hence, the goals achievable with S3 might also differ, depending on the specific regional configuration.

Hence, policy mix and instruments might need adaptation to the regional context and the needs of specific industries and types of firms to ensure effectiveness and enhance the efficiency of public support, which is not the case yet in many regions. Despite an elaborate definition of priority trees, regional authorities do not target priorities specifically. The calls usually address all priorities at once, with the same instruments, except very few attempts of some Italian regions for more specific intervention (Gianelle, Guzzo & Mieszkowski, 2019a; 2019b).

3.2. National smart specialisation context

The subchapter is based on secondary data and provides a comparative overview of innovation policy context and approach to S3 in Lithuania and Poland, based on the six steps and 12 thematic issues mentioned in the RIS3 Guide. The subchapter presents a descriptive review of innovation policy and its context in Lithuania and Poland and serves as background information for further in-depth analyses. The description is a somewhat extended version of the brief review provided in Keil (2019):

1. It presents a short overview of the innovation-related policy approaches before introducing S3 and national innovation systems' main characteristic.
2. It compares approaches to S3 in both countries, evaluating the completion of the six steps of S3, specified by the EC in the RIS3 Guide.
3. It compares both countries' strengths and weaknesses regarding the S3 related thematic issues identified in the RIS3 Guide.

The subchapter is entirely based on secondary data. It addresses the question:

> *What characterised S3 and EDP in Poland and Lithuania, concerning six steps approach and thematic issues, distinguished in the RIS3 Guide.*

3.2.1. Innovation policy before S3

The innovation policy review for each country covers two periods: early innovation policy before 2006 and 2007–2013. It also summarises the situation at the beginning of introducing S3, which officially started in 2014. Finally, the review briefly addresses countries' experience with the involvement of the private sector in the decision-making process and summarises their position in the innovation rankings.

3.2.1.1. Lithuania

Among the first documents to recognise the importance of innovation policy worth mentioning are the *Long-term Strategy on Development of Lithuania* (developed in 2002) and the *Lithuanian Science and Technology White Paper* (developed in 2001, it was the first integrated strategy and vision for R&D) (OECD, 2016). According to Juknevičius et. al (2019), during the 2000-2006 period, strategic policy documents addressed three paramount goals:

- Developing the field of science in which Lithuania has its intellectual potential;

- Creating an R&D&I based (knowledge) society;
- R&D&I support, strengthening traditional economic sectors;

Despite weak analytic policy capacity, priorities were set in a top-down manner, resulting in ambitious strategies but poor implementation because of scarce resources (OECD, 2016). The main programmes were the *Innovation in Business Sector Programme 2003-2006* and the *High-technology Development Programme 2003-2006* (the latter targeted already established high-technology industries) (OECD, 2016).

In the 2000-2006 period, HEIs (particularly universities) were primary beneficiaries of support dedicated to research infrastructure. Compared to other EU countries, Lithuania was highly specialised in basic research, mainly in natural sciences, mathematics, and computer sciences (ERAWATCH Network, 2006a). At the same time, technological specialisation was restricted to electronic equipment and office machinery, while economic specialisation concentrated on telecommunication and transportation (ERAWATCH Network, 2006a).

EU funds, to some extent, replaced national support (Kriaucioniene, 2009) and in the financial programming perspective 2007-2013 became important source of financing R&D and innovation (OECD, 2016). However, R&D resources were concentrated asymmetrically, and inter-sectoral links were weak (Kriaucioniene, 2009). The number of graduates in science and technology was high. However, this strength could not be fully exploited because of deficits in the public higher education sector and missing carrier opportunities (Kriaucioniene, 2009).

The EU's Lisbon Strategy Agenda affected the content of strategic documents in 2007-2013, which can also be characterised as a period of learning to design policy processes and instruments (OECD, 2016). Innovation policy from the previous period was continued, but with more emphasis on its implementation and attempts to address identified shortcomings (OECD, 2016). Investments primarily focused on infrastructure, while the policy mix addressed predominately high-tech industries, which resulted in the technology-push approach, leaving large parts of the economy unattended (OECD, 2016).

During the 2007-2013 period, significant investments in developing research infrastructure have been made implementing *Valleys'* initiative, which aimed to establish joint R&D&I infrastructure involving both HEIs and business organisations. The implementation of public R&D&I infrastructure projects involved universities and research institutes, clinics, science and technology

parks, private universities, colleges, and other organisations operating in the science and study system (Juknevičius et al., 2019, p. 44). International experts have also participated in the Valleys' creation process. Among the central outcomes from the period are open access centres and research infrastructures, clusters and innovation support networks (e.g., science and technology parks, business incubators), and conditions for investments created through developing investment innovation zones. The goal to address the science-industry gap has largely failed, but some of the policy-mix measures introduced to support business R&D and innovation (e.g., SME innovation vouchers) were a significant step towards a more balanced innovation policy (OECD, 2016).

As can be noted from Table 18, in Lithuania, in the financial programming perspective 2014-2020 the focus of objectives shifted from strengthening capacities of the innovation system predominately through improving general surrounding conditions towards enhancing the use of existing capacities.

Table 18 – Comparison of ESIF investment objectives in Lithuania during financial programming perspectives 2007-2013 and 2014-2020.

2007-2013	2014-2020
1 Increase the share of high value-added businesses; 2 Boost productivity, particularly by creating favourable conditions; for innovation and small and medium enterprises (SMEs); 3 Improve the efficiency of economic infrastructure.	1 Promoting the use of existing and new RDI infrastructure; 2 Enhancing the intensiveness of RDI activities in the private sector; 3 Enhancing knowledge commercialisation and technology transfer; 4 Strengthening skills and capacities of the public research sector.

Source: reprinted from Keil, 2019, p.12[5].

When introducing S3, two ministries have pursued innovation-related policies in Lithuania (Paliokaitė, 2015). The Ministry of Economy coordinated the domain of innovation policy. The Ministry of Education and Science (Since 2019, Ministry of Education, Science and Sport) was responsible for education and public R&D Policy. This division led to the competition and lack of trust between these ministries (Paliokaitė, 2015). The Ministry of Finance has been accountable for ESIF funds (Paliokaitė, 2015). Thus, coordination between the relevant ministries and policy domains relating to science and innovation could be deemed insufficient.

5 Originally, compilation from https://ec.europa.eu/regional_policy/en/atlas/programmes/ (retrieved 25.01.2019)

Lithuania's innovation system has been deemed fragmented by numerous reports (OECD, 2016; Paliokaitė, 2017; Paliokaitė, Petraitė & Gonzalez Verdesoto, 2018). Fragmentation means that there is no single body coordinating innovation policy. There are many actors, including policy-implementing organisations, and their tasks often overlap (for a detailed scheme of Lithuanian research and innovation system governance structure, see Appendix 2, Figure 14).

Considering the experience with stakeholder involvement in the decision-making process, following established practices could be distinguished (based on Siman, 2006):

- Informal involvement, including consultations and participation in advisory groups;
- The general dialogue was occasional and often limited to the instigation stage;
- Joint initiatives, such as initialising networks, were more common at the implementations stage.
- The public sector initialised most of the interaction instruments (except occasional unsolicited contributions).

A comparative study *Private Sector Interaction in the Decision Making Processes of Public Research Policies* (Braun et al., 2006) showed that Lithuania had already established or recently introduced nearly all distinguished forms of interaction with the private sector in research policy design and making. However, the challenges the country faced when introducing S3 may suggest that, concerning this aspect, policy learning was still not sufficient.

According to *European Innovation Scoreboard 2019*, Lithuania belongs to moderate innovators. However, its performance has been improving rapidly and increased by 25,7% point between 2011 and 2018. It is the most remarkable change in performance across the EU. The most notable increases in the performance Lithuania witnessed in 2015, 2016, and 2018.

3.2.1.2. Poland

In Poland, innovation policy as a distinct policy area can be traced back to the beginning of the 1990ies (Ciok & Dobrowolska-Kaniewska, 2009). At that time, the first innovation policy documents were adopted, such as the *Assumptions of the state's science and technology policy* in 1993 and the *Assumptions of the state's pro-innovation policy* in 1994 (for a detailed list of documents, see Ciok & Dobrowolska-Kaniewska, 2009, p. 22). However, between 1990 and 2007, the science and technology policy in Poland was characterised by (Jasiński, 2018, p. 231):

- The lack of a long-term strategy for the development of science and technology;

- Policy fluctuations;
- Insufficient coordination of activities between government agencies;
- A relative decrease in budget expenditure on R&D;
- Centralisation of policy, especially research funding and a lack of a regional approach;
- Too little support for applied research in funding decisions;
- Too much emphasis on supporting science rather than innovation;
- No policy for technology transfer/diffusion of innovation.

The government got stronger engaged in pro-innovative policy at the beginning of the twenty-first century, aiming to prepare Poland's accession to the EU and in connection to the Lisbon Strategy Agenda (Ciok & Dobrowolska-Kaniewska, 2009). Among other documents in this period, in 1997 and 2000 Ministry of Economy adopted ambitious support programmes: *Programme to support the development of regional institutions operating for technology transfer in the SME sector* and *Increasing the innovativeness of the economy in Poland until 2006* (Jasiński, 2006; Ciok & Dobrowolska-Kaniewska, 2009). However, the first has been rather declarative, and the second was not implemented because of the lacking funds (Jasiński, 2006, pp. 197-198). *Sectoral Operational Programme - Increase of the competitiveness of enterprises*, adopted in 2004, along with the OP for the human resource development and integrated regional development OPs could be implemented to a large extent (Ciok & Dobrowolska-Kaniewska, 2009).

Before the financial programming perspective 2007-2013, Poland was characterised by a shift in the R&D funding shares: declining business share and increasing public funding (ERAWATCH Network, 2006b). Moreover, there was a mismatch between scientific specialisation, business specialisation and target audience of public funding. Thus, public funding targeted higher value-added sectors, while businesses specialised predominately in the relatively low R&D intensity sectors (ERAWATCH Network, 2006b). According to Nill (2008), the lack of big companies and the dominance of SMEs (with less than 250 employees) in the Polish business landscape might be a reason for the low business spending on R&D.

Between 2007 and 2013, Poland has also introduced reforms to its research system, e.g., the *National Reform Programme (2005-2008)* to implement Lisbon targets, or a package of acts, adopted by the Council of Ministers in December 2008 (*Act on the Principles of Financing Science; Act on the Polish Academy of Sciences; Act on Research Institutes; Act on the National Research and Development Centre; Act on the National Science Centre*) (Górzyński & Jakubiak, 2009). As a consequence of the aforementioned acts, funding should move away from the statutory

approach towards projects, aiming to increase its effectiveness and channel support toward the most competitive research units (Górzyński & Jakubiak, 2009).

Two initiatives intended to identify evidence-based research priorities: the National Foresight Programme (*Poland 2020*) and "the Strategic Research Agendas prepared by the Polish Technology Platforms" (Górzyński & Jakubiak, 2009, p. 22). The Ministry of Economic Affairs managed the innovation policy domain. The Ministry of Regional Development was responsible for the national development strategy, management of EU funds, and regional operational programmes. Before introducing the regional strategies and providing regions with significant resources from European Structural Funds to support innovation, the role of regions in policymaking had been limited (Górzyński & Jakubiak, 2009).

According to Górzyński and Jakubiak (2009), missing links and low cooperation levels suppressed knowledge circulation between business, government and higher education institutions. Firms possessed low absorptive capacity, and R&D non-intensive sectors prevailed. The foreign subsidies somewhat compensated for the relatively low demand for sophisticated R&D and knowledge in the domestic business sector. At the start of the financial programming period 2014-2020, the level of business investments in R&D remained low and synergies between science and industry - limited (Klincewicz, 2014b). Numerous public research facilities have been situated outside of universities, and government instruments used to strengthen science-business collaboration did not build strong linkages with industry and society (Marklund et al., 2017).

In Poland, the objectives formulated for both perspectives appear similar, as Table 19 suggests. The focus has been on strengthening and enhancing the innovation system's capacities, in 2007-2013 concentrating on the scientific potential and HEIs within the innovation system, and in the following period focusing on the enterprises.

Table 19 – Comparison of ESIF investment objectives in Poland during financial programming perspectives 2007-2013 and 2014-2020.

2007-2013	2014-2020
1 Improving enterprise innovativeness 2 Improving the scientific community's competitiveness in Poland 3 Strengthening economic development through good science 4 Increasing the international market share of innovative products made in Poland 5 Creating permanent and better places to work 6 Boosting ICT usage in Poland's economy.	1 Increasing the number and the quality of research and development projects carried out by enterprises; 2 Improving the institutional conditions enabling enterprises to engage in R&D activities and enhancing their potential for R&D; 3 Supporting innovation in enterprises, in particular by providing financial instruments for innovative investments and assisting innovative exporting companies from key sectors in further internationalisation; 4 Enhancing the links between public research, business and the needs of the economy by investing in strategic public R&D infrastructure and research programmes with the highest potential for the Polish economy;

Source: reprinted from Keil, 2019, p.13[6].

Divided responsibility for STI and Innovation policies between different Ministries, preceding S3, with each running separate foresight programmes. So, besides the National Foresight Programme (Poland 2020) run by Ministry of Science and Higher Education, the Ministry of Economy initialised another foresight project: T*echnological Foresight of Industry (InSight 2030).* According to the Ministry of Economy, the two foresight projects mentioned above have been starting point for defining national-level smart specialisations in Poland (Ministerstwo Gospodarki, 2014, p. 5). With this respect, introducing S3 could be interpreted as some starting point for integrating innovation-related policies in Poland. However, as mentioned by Klincewicz (2014a), foresight exercises did not lead to genuine prioritisation. They distinguished rather broad areas with a proliferation of detailed themes or technologies (114 macro-themes and 680 detailed R&D themes in Poland 2020; 35 areas and 127 technologies in *InSight 2030*).

At the time of adopting S3, the number of actors involved in the research and innovation system governance was high, indicating the system's fragmentation (for a detailed scheme of Polish research and innovation system governance structure, see Appendix 2, Figure 15). However, shortly after that, a significant change was introduced to improve coordination. Thus, at the beginning of 2016, the *Council for Innovativeness* (an inter-ministerial body) was established to advance innovation in Poland (Klincewicz, Szkuta & Marczewska, 2017, p.7).

6 Originally, compilation from https://ec.europa.eu/regional_policy/en/atlas/programmes/ (retrieved 25.01.2019)

Considering the experience with stakeholder involvement in the decision-making process, following established practices could be distinguished (based on IKU Innovation Research Centre, 2006):

- General discussion taking place mainly during design and implementation (most common means are conferences, with other less established instruments, e.g., informal consultation or discussion platforms);
- Advice had been collected mainly through formal consultations, initialised by the public sector (regularly practised for legislative initiatives);
- Regarding co-design and decision-making, the country began to use evaluation studies (as means of collecting expertise at the stages of design, implementation, and review);
- The private sector was relatively active in initialising interaction. Several instruments were initialised by both sides.

A comparative study of *Private Sector Interaction in the Decision Making Processes of Public Research Policies* (Braun et al., 2006) showed that in Poland, the only established forms of interaction with the private sector in research policy design and making were conferences and formal consultations. However, several other forms were used occasionally or were at the introductory stage. Thus, Poland's experience with the majority of the instruments was relatively fresh when introducing S3, especially compared to the "old" EU member states.

According to *European Innovation Scoreboard 2019*, Poland improved its performance between 2011 and 2018, increasing by 7,8% points in the mentioned period, close to the average performance change across the EU. Poland's innovation performance showed some fluctuations up to 2015 and continuously increased afterwards.

3.2.2. Addressing six steps of S3

The following subsections summarise the steps of designing S3 based on different dimensions specified in the RIS3 Guide and the "RIS3 Assessment Wheel", which is a tool developed by the EC's Joint Research Centre (JRC) to help regions to evaluate each step (for more information on the tool, see Appendix 3). The section concerns the financial programming perspective 2014-2020 and official preparations for S3. However, sometimes it also refers to the earlier documents, when countries or regions declare them as related to S3. The information collected from the official documents and reports during the research process provides the basis for the elaboration. The

section focuses on the national level. For Poland, selected aspects are also addressed at the regional level.

3.2.2.1. Analysis of the regional context and potential for innovation

The first step of the S3 approach is "Analysis of the regional context and potential for innovation-leading". Table 20 provides an overview of how Lithuania and Poland addressed this step.

Table 20 – Comparing analysis of context

STEP 1 ANALYSIS OF REGIONAL / NATIONAL CONTEXT			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Regional / National Assets	For S3, experts prepared reports on the potential of Lithuanian science and business sectors and reports on societal challenges globally and their impact on LT innovation policy and the long-term challenges LT is facing.	Foresight exercises carried out before S3: technology foresight and industry foresight. These served as analytical bases for S3.	Quality of analyses of regional asset analyses varied across regions, with some of them using sophisticated techniques (e.g., Śląskie).
Outward Dimension	Benchmark with other regions or positioning priorities in the international value chains is missing in the analyses. The analysis for the purposes of S3 included global challenges and trends (see Technopolis Group, 2013).	Benchmark of the S3 priorities with other regions or their positioning in international value chains is missing in the analyses at the national level. Analysis of global trends and challenges addressed in the *Insight 2030* for the ten distinguished fields (however, these fields do not entirely correspond to the S3 priority fields).	Only partly addressed in some regions (e.g., Wielkopolska, Śląskie). Half of the regions belong to the thematic S3 platforms (industry modernisation or energy). Some regions bounded their forces to advance specialisations to the national level (e.g., Pomorskie, Zachodniopomorskie, and Kujawsko-Pomorskie advanced maritime specialisation).
Entrepreneurial Dynamics	Mixed working groups, relying upon expertise in the fields; Analysis of entrepreneurial dynamics is missing.	Mixed working groups, relying upon expertise in the fields; Analysis of entrepreneurial dynamics is missing.	The most common approach to EDP combines knowledge from already functioning institutions, networks and clusters with stimulation of stakeholders and direction of exploration and cognitive effort towards adopted goals. Tracking the natural activity of stakeholders is rare.

Source: own elaboration, based on Vyriausybė Strateginės Analizės Centras (STRATA), n.d.-e (S3 reports in the section "Tyrimų archyvas"); Ministerstwo Gospodarki, 2014; Pierzchała et al., 2021; Urząd Marszałkowski Województwa Wielkopolskiego, 2015; Urząd Marszałkowski Województwa Śląskiego (UMWŚ), 2017; Ministerstwo Rozwoju, 2020, p. 62.

Both Lithuania and Poland have chosen a foresight-based approach at the analytical stage. Notably, both countries paid little attention to the outward dimension of smart specialisation at the national level, as can be concluded due to lacking elaboration on this aspect in the extant S3 documents.

3.2.2.2. Governance

Table 21 presents a brief overview of the S3 governance in Lithuania and Poland.

Table 21 – Comparing governance

STEP 2 GOVERNANCE			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Governance Structures	Complex structures: 3 ministries (FM as supervising institution, EIMIN and SMM as coordinating institutions), many implementing bodies (e.g., CPVA, MITA, LVPA), advising bodies. S3 management bodies: Science, Technology and Innovation Council (Advisory body); Steering Committee; Coordinating Group (informal, includes representatives from coordinating ministries and agencies); STRATA as organising and coordinating entity + expert working groups.	National and regional levels. Ministry of Development as responsible institution. Implementing agencies at the national level: Polska Agencja Rozwoju Prezdsiębiorczości (PARP); Narodowe Centrum Badań i Rozwoju (NCBR). S3 management bodies: Steering Committee; Consultation Group; Working Groups; MoE as the coordinating entity at the national level + expert working groups.	Marshal Offices at the regional level handle all activities, including stimulation of working groups activity and cooperation with regional stakeholders. In Śląskie, regional observatories are important bodies in governing specific specialisations.
Broad Participation	Triple Helix Basis Working groups representing policy-makers, business and science; extensive use of boundary spanners; society and market are missing, although societal challenges are considered. After submitting S3, participation decreased; working groups met ad hoc.	The participative process is ensured to the extent of pilot initiatives (smart panels and smart labs) led by PARP; society's involvement and market perspective are hardly recognisable and difficult to assess based on the available documents.	Predominately triple Helix Basis Working groups were most active at the stage of defining S3. In one-third of the regions, EDP dynamics slowed down after selecting or updating priorities, and the process is rather occasional. Other third of regions maintains relations with stakeholders regularly. A large group of regions uses EDP to get the data for ongoing S3 verification and updating.
Management & Communication	Consultation of documents mainly through the working groups. S3 website as a source of information; citizen dialogue or e-feedback platform is lacking.	Consultation of documents mainly through the working groups. S3 website as a source of information; citizen dialogue or e-feedback platform is lacking.	Even though public consultation became a planning standard, it is difficult to evaluate the actual level of public involvement (Pander et al., 2014). Some regions published lists of comments collected during the consultation of their innovation strategies (e.g., Dolnośląskie, Małopolskie).

Source: own elaboration based on OECD, 2016 p. 127; Paliokaite, 2015, p. 3; STRATA, n.d.-e (S3 reports in the section "Tyrimų archyvas"); Ministerstwo Gospodarki, 2014; Ministerstwo Rozwoju, 2020; Pander et al., 2014; Pierzchała et al., 2021; Urząd Marszałkowski Województwa Dolnośląskiego (UMWD), 2015; Urząd Marszałkowski Województwa Małopolskiego, 2018.

Thus, both countries adopted the triple helix approach but struggled with the leadership within priorities. Using boundary spanners at the initial stages of strategy design has been more extensive in Lithuania, but later this advantage has not been fully exploited. In Lithuania, the distribution of responsibilities and power to make decisions appears more complex, as reflected in the formal structure. However, Poland has two-level strategies: national and regional, Lithuania – only national. To ensure participation, Poland uses the smart-labs technique, introduced in the World Bank pilot project, in an adjusted form to fit the national context. During this research project, no similar approach has been spotted in Lithuania.

3.2.2.3. Shared vision

The third step of the process concerns establishing a shared vision. Table 22 provides an overview of addressing the step in Lithuania and Poland.

Table 22 – Comparing vision

STEP 3 SHARED VISION			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Broad View of Innovation	One field out of six reflected non-technologically based innovation (Inclusive and creative society).	Creative industries are distinguished as one of the priorities.	Present at the regional level (e.g. creative industries in Małopolskie and Kujawsko-Pomorskie), often found under broad priority labels (e.g., *quality of life* in Mazowieckie or Podkarpackie; *emerging industries* in Śląskie, *water economy* in Warmińsko-Mazurskie).
Grand Challenges	Have been addressed during S3 design.	Addressed in *InSight 2030.*	Addressed in some regional innovation strategies (e.g., Dolnośląskie). However, commonly insufficiently addressed in the innovation strategies at the regional level or S3 documents.
Scenario Analysis	Lacking elaboration on risk assessment and contingency plan for possible future changes.	Lacking elaboration on risk assessment and contingency plan for possible future changes for S3 priorities, but scenario analysis addressed for the technology fields in *Insight 2030*.	Typically, the development perspectives of selected specialisations or their importance for the regional development (beyond the economic aspect) are insufficiently addressed. In the regional innovation strategies or documents describing S3, the analysis mostly is limited to the description of a regional context, with rare exceptions (e.g., Śląskie), referring to the scenario analysis.

Source: own elaboration based on STRATA, n.d.,-e (S3 reports in the section “Tyrimų archyvas”); European Commission, n.d.-d; Polish Chamber of Commerce for High Technology, 2011b; Pander et al., 2014; UMWD, 2015; UMWŚ, 2017.

Creative industries and activities related to social sciences and humanities gained just one out of 20 priorities in Poland and one out of Lithuania’s six priority fields. However, in Lithuania, Grand

Societal Challenges have been considered while developing S3. In both countries, business is the primary target of the communication efforts because of the prevailing view that S3 is most relevant to the firms that might apply for the funds. Identifying different stakeholder groups and their motivation to engage with the S3 has been somewhat neglected, except for business-related stakeholders. Notably, both countries have strategies addressing the vision of their development, which have not been developed specifically as part of the S3 exercise. In Lithuania, it was "*Lietuva 2030*" (Valstybės pažangos strategija…, 2012, May 30), in Poland: "*Strategia Innowacyjnosci i Efektywnosci Gospodarki*" (SIEG) (Strategia Innowacyjnosci…, 2013, February 13).

3.2.2.4. Identification of priorities

The fourth step distinguished in the RIS3 Guide is the identification of priorities. With the introduction of S3, an extensive list of priorities in both countries emerged: six areas and 20 priorities in Lithuania, five areas and 20 priorities in Poland. Table 23 provides an overview of the prioritisation in Lithuania and Poland.

Table 23 – Comparing identification of priorities

STEP 4 IDENTIFICATION OF PRIORITIES			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Revision of Past Priorities	Policy-makers did not identify any past priorities, providing a base for S3. There is a lack of relevant experience with innovation strategies similar to S3 (such as a previous generation of *Regional Innovation Strategies*).	S3 priorities defined based on the key areas and technologies identified in the foresight projects.	Most regions have built their S3 upon existing documents or supplemented them with S3 priorities.
Consistency	Initially, 20 specific priorities were defined but later broadened (eliminating specific detailed lists of technologies). Priority field *An inclusive and creative society* can be considered horizontal, as well as ICT priority (see Appendix 4).	Foresight projects resulted in extensive lists of technologies (over 300), categorised into broader priorities and priority areas when defining S3. The horizontal priority field, innovative technologies and industrial processes, is diverse (see Appendix 4).	Some regions explicitly distinguished horizontal priorities, e.g., ICT in Podkarpackie.
Critical Mass	The first S3 document defined six priority areas, which include 20 priorities defined (each area has two to four specific priorities, with a more detailed list of relevant technologies).	The first S3 document defined 18 (shortly afterwards increased to 20, adding creative technologies and maritime) priorities distributed across five priority areas. Each of the 20 priorities includes a detailed description of relevant technologies.	Three to seven priorities at the regional level.

Source: own elaboration based on Visionary Analytics, 2013a; STRATA, n.d.-c, Ministerstwo Gospodarki, 2014; Ministerstwo Rozwoju, 2020; European Commission, n.d.-d.

As stated in the RIS3 Guide:

> *"If the areas are presented in a too generic way, such as eco-innovation, green energy, sustainable mobility or healthcare, most regions will fail to point out their unique competitive strengths. To be credible, effective and suitable for a concrete action plan (see next step), the priorities need to be expressed more precisely, such as ICT-based innovation for active ageing, innovative solutions to reduce city congestion, wood-based solutions for eco-construction, etc"* (European Commission, 2012, p. 52).

With the above in mind, it is possible to evaluate the evolution of both countries' priorities on the criteria of credibility, effectiveness and suitability for the concrete action. Table 72 in Appendix 4 demonstrates the evolution of priorities in Lithuania. These have been revised one time since the adoption of the first Lithuanian S3. At first sight, one can notice that the number of priorities dropped dramatically, from initially 20 to seven. However, a closer look reveals that the former six priority fields became official priorities while the former 20 priorities became descriptions of priorities, i.e., themes to be financed within priorities. There are seven, instead of formerly six, fields because ICT and transportation have been split.

Moreover, one can notice that instead of the former 20 priorities, there are 22 themes to be financed now. Most new themes emerged within ICT and inclusive and creative society priorities. Simultaneously, few formerly distinct priorities have been pulled together into one description, as, e.g., solar energy and generating power from biomass, formerly being distinct priorities within the energy field, now became one theme. Some fields did not change their priority list yet, e.g., health technology and biotechnology.

Unlike in Lithuania, where there is one working group per priority field, Poland has a working group for every priority. Table 73 in Appendix 4 compares the first version to the version of 2020, which allows the comparison of development in the same time frame as in Lithuania. In Poland, fields remained the same, but the number of priorities decreased from 18 to 14 partly because of the less specific definition of priorities. A prominent example of broader definition represents the field "healthy society", which includes now only one priority bearing the same name as the field, compared to the formerly more specific wording, expressed as three distinct priorities in the first version.

3.2.2.5. Definition of the policy mix, roadmaps and action plan

Countries and regions may design their policy mix, choosing from a broad range of different support measures. Policy mix design may also depend on the objectives. Table 24 compares the policy mix in Lithuania and Poland.

Table 24 – Comparing policy mix

STEP 5 POLICY MIX			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Roadmap	Working groups prepared roadmaps for each priority field, which were not entirely adopted but merely served as a basis for the support measures and action plans.	No information on roadmaps developed by the stakeholders is available. Implementation occurs through Operational Programme Smart Growth (pol.: POIR), which includes action plans.	Implementation through the Regional Operational Programmes (ROPs).
Balance	Measures targeting specific priorities are scarce (e.g., Ministry of Education introduced the measure "R&D activities of parallel laboratories" for the priority field "Health Technology and Biotechnology".	Measures equal for all the priorities.	Measures equal for all the priorities.
Framework Conditions	Ministry of Finance concentrates on "save" investments and aims to ensure the EU's trust by avoiding risky undertakings in allocating funds through control of coordinating institutions. Consequently, instead of launching joint support measures for business-science collaboration, two coordinating ministries have their own support measures (although joint projects are still possible).	A broad portfolio of support measures includes risk-capital-based instruments and more flexible financing rules because of the distinction between pre-commercial and commercial stages. 33,7% of projects financed by POIR started at the TRL II, 37,5% at TRL III. Initially, some POIR measures competed with each other (e.g., measures 4.1.2 and 4.1.4, in the priority axis IV), which allowed applicants to submit applications to either of them.	Formally, ROPs allowed financing projects from technology readiness level (TRL) II to IX (same as POIR). According to NCBR reports, beneficiaries who fulfil the criteria set by ROP and POIR are free to choose but prefer POIR because of the higher flexibility and reputation of NCBR. Usually, ROPs criteria differ from those set by NCBR and vary from region to region.

Source: own elaboration, based on STRATA, n.d.-e; Prioritetinės mokslinių tyrimų…, 2019; Juknevičius et al., 2019; Visionary Analytics, 2017, p. 2; Program Operacyjny Inteligentny Rozwój na lata 2014-2020 (POIR), 2018; Narodowe Centrum Badań i Rozwoju (NCBR), 2018; Klimczak & Pylak, 2020.

The notable difference within the mix of support measures is that Poland distinguishes economic and non-economic activities, allowing support for the development of projects at the early stages. Although riskier, it might be more rewarding if the projects become successful. Lithuania is more risk-averse and does not draw this difference, resulting in HEIs having difficulties joining collective projects with business, as they cannot contribute their funding. Poland also has more extensive use of risk-capital-based financial instruments. On the other hand, Lithuania added pre-commercial procurement to its instrument portfolio during the financial programming perspective 2014-2020. Appendix 5 provides a comparative overview of the support measures available in Lithuania and Poland. Notably, Poland has a more diversified portfolio.

3.2.2.6. Monitoring and evaluation

Table 25 provides a comparative overview of S3 monitoring in Lithuania and Poland.

Table 25 – Comparing monitoring and evaluation

STEP 6 MONITORING & EVALUATION			
Aspect	**Lithuania**	**Poland (national level)**	**Poland (regional level)**
Output & Result Indicators	In place and publicly accessible in the yearly monitoring reports, and from 2019 in an online tool.	Publicly accessible with the tool Smart Radar, in 2020.	Vary from region to region. Available statistical indicators and data from operational programmes are most commonly used.
Monitoring	In place from 2017 (when the first monitoring report appeared). However, implementation struggled, and the report showed the status quo and not the actual progress due to S3.	A publicly accessible monitoring system took time to get established. Several evaluations appeared or are planned. Those already conducted by PARP are not specific to distinct priorities.	Solid in some regions; different standards. Some regions published separate monitoring reports for each specialisation (e.g., Dolnośląskie, Śląskie).
S3 Update	Revised 2019	Priorities are updated yearly.	Updated in some regions, e.g., Śląskie.

Source: own elaboration, based on https://rodikliai.strata.gov.lt/?v=1&lang=lt&kpi_type=olevel&kpi_group=5; STRATA, n.d.-c; https://smartradar.smart.gov.pl/; Pierzchała et al., (2021); Examination of regional innovation strategies and information on the regional S3 websites linked at https://smart.gov.pl/pl/ (examples from UMWD, n.d.; UMWŚ, 2017).

The major challenge to quantitative monitoring is the availability of relevant data. Traditional economy indicators collected by statistical offices proved of little use for monitoring priorities. Among difficulties could be distinguished use of NACE or related national-level classifications to reflect the evolution of priorities concerning their relevance for the economy. Lithuania established quantitative monitoring early, and monitoring reports have been issued regularly. National-level monitoring in Poland has been a struggle during the whole financial programming perspective, and only in 2020, an online tool (Smart Radar) was introduced. However, compared to the tool available for Lithuania (*Interaktyvus Sumanios specializacijos stebėsenos duomenų įrankis*), which STRATA introduced in 2019, *Smart Radar* provides only part of the data by priorities. Notably, creating a comprehensive monitoring system might be more challenging in Poland because of the two-tier S3, which implies aligning regional and national levels data and displaying it at the necessary level of detail (e.g., by priorities and regions). Currently, each region in Poland also has its S3 monitoring system and uses distinct methods. These include statistical data, benchmarking

with other regions, or qualitative methods (interviews with entrepreneurs and focus-group discussions). In Lithuania, qualitative monitoring or benchmarking is not apparent in the published reports.

3.2.3. Addressing thematic issues within S3

RIS3 Guide also outlines the thematic issues to consider when designing S3. The following subsections elaborate on the potential and context within specific thematic issues in Lithuania and Poland. The review addresses the national context, and for Poland, selected aspects also at the regional level.

3.2.3.1. Clusters and smart specialisation

The report on clusters in Poland, published by PARP (Buczyńska et al., 2016), counted 134 clusters, a great deal of them (48%) in the four voivodeships: Mazowieckie, Dolnośląskie, Wielkopolskie and Śląskie. Additionally, the report identified 106 structures that did not meet the cluster criteria yet but might develop into clusters within time. The report also notes that Poland's clusters are relatively young. Most of them (60%) emerged between 2011-2015.

At the national level in Poland, several references to clusters appear in the official S3 documents (KIS), among others, issued by Ministerstwo Gospodarki (2014) and Ministerstwo Rozwoju (2020). Thus, according to the documents mentioned above, clusters' representatives have been members of the working groups, clusters are addressed with the public support measures, and qualitative analysis considered cooperative ties and clustering. However, cluster potential, which may back selected specialisations at the national level, can be deemed not sufficiently elaborated in the official S3 documents. Hence, analyses addressed the number of clusters in the specific industries, but selected specialisations are rather cross-sectoral and technology-based. As noted in the KIS documents, measures aiming at cluster development are horizontal and connect to several economic policy domains. Stronger connections between clusters and smart specialisations can be observed at the regional level, also visible in the analyses provided in the first version of the KIS document (Ministerstwo Gospodarki, 2014, pp. 56-57; p. 64). According to Buczyńska et al. (2016, p.36), selected specialisations are most congruent with clusters' activities in Śląskie, Pomorskie, Kujawsko-Pomorskie, Lubelskie, Łódzkie, Opolskie and Świętokrzyskie. Warmińsko-Mazurskie

and Lubuskie had the weakest match between their clusters and selected specialisations (Buczyńska et al., 2016, p.36).

In Lithuania, the study by Mokslo, inovacijų ir technologijų agentūra (MITA, 2017) identified 64 clusters, still active in 2017. As noted in the study, Lithuanian clusters are also young, the majority created between 2010 and 2015, with most clusters created in 2015. According to MITA (2017, p.26), documentation of the S3 process in Lithuania lacks the information on cluster analysis, and it is not clear whether any resources of clusters have been involved. Thus, Lithuania belongs to the key regions regarding the blue growth industries and logistical services (MITA, 2017; Naumanen, 2019). However, Lithuanian S3 does not explicitly include blue growth in its priorities.

An indicator of internationally visible potential may be a presence in traded clusters, which represent traded industries. “Traded industries are groups of related traded sectors, connected through multiple types of linkages. They are geographically concentrated, sell their products and services across many regions, and face competition from other regions”, and “traded clusters are geographic concentrations that result from the cluster mapping of traded industries, and hence are groups of closely located and related traded industries” (Naumanen, 2019, p. 11). Lithuania was among *strong nations* in numerous traded clusters, considering high growth firms per inhabitant. Poland was less prominent but had some advantages considering absolute values (Naumanen, 2019). The definition of a high-growth firm follows Eurostat-OECD, which “requires that a company’s turnover or the number of employees must increase by 73% over a three-year period” (Naumanen, 2019, p. 15). As an additional criterion, the company had to have total assets of at least 500 000 euros (Naumanen, 2019, p. 15). Table 26 summarises the strengths of each country.

Table 26 – High growth firms in traded clusters

Lithuania (2019) (per inhabitant)	**Poland (2019)** (absolute value)
- paper and packaging; - plastics; - water transportation; - business services (only in terms of employees); - marketing, design and publishing; - IT and Analytical instruments (only in terms of turnover); - environmental services; - hospitality and tourism (turnover and assets); - performing arts; - transportation and logistics; - medical devices (turnover and assets); - appliances (only turnover); - aerospace vehicles and defence (turnover and assets);	- paper and packaging (assets only); - plastics (turnover and assets); - appliances (turnover only);

Source: own elaboration, based on Naumanen, 2019.

The number of clusters in both countries is relatively high, considering the economy and population size. Table 27 presents a comparative overview of cluster numbers and their facilities across selected countries. The data stems from the *European Cluster Collaboration Platform* (https://www.clustercollaboration.eu/cluster-mapping) and applies to the registered clusters (as of October 2020). These are not all the clusters in the respective countries. However, it may be a relevant indicator for the more active clusters, which might also be oriented towards international collaboration.

Table 27 – Cluster organisations and their facilities in selected countries (2020)

	Lithuania	**Poland**	**Estonia**	**Sweden**	**Germany**
Number of clusters organisations	24	68	11	29	86
Facilities					
Incubator	*0*	*2*	*3*	*3*	*2*
Accelerator	*0*	*2*	*2*	*1*	*8*
Co-working space	*1*	*1*	*3*	*2*	*4*
Investor	*0*	*2*	*2*	*1*	*2*
Technology centre	*2*	*5*	*0*	*2*	*11*
Facilities in total (% of all clusters)	3 (12,5)	12 (17,6)	10 (90,1)	16 (55)	27 (31)
ESCP-4i membership	2	11	2	7	23
Areas of S3 partnerships (max 9)	1	4	1	0	3

Source: own elaboration, based on https://www.clustercollaboration.eu/cluster-mapping

Compared to the innovation leaders, e.g., Sweden and Germany, the number of facilities in Lithuania and Poland, typically offered by clusters, is relatively low. In Estonia, the number of facilities compared to the total number of clusters reaches 90%. A low number of available facilities might indicate the low capacity in clusters to support the development of innovative enterprises.

Notably, the distribution of clusters in Poland varies across regions. According to the PARP report (Buczyńska et al., 2016), Śląskie has 28 clusters, but the cluster collaboration platform included 10. On the other hand, Mazowieckie has 13 clusters according to the PARP report and 11 clusters registered on CCP. Table 28 represents clusters' distribution across Poland's regions (the statistics includes clusters, but not cluster initiatives that do not meet the cluster criteria yet).

Table 28 – Regional clusters in Poland

Region	Cluster organisations registered on CCP (2020)	Cluster organisations (PARP, 2016)	Potential clusters (PARP, 2016)	Economic specialisations of clusters (PARP, 2016)
Dolnośląskie	5	11	12	8
Kujawsko-Pomorskie	2	4	10	4
Lubelskie	5	11	5	7
Lubuskie	1	4	1	3
Mazowieckie	11	13	22	9
Małopolskie	5	10	6	8
Opolskie	0	1	3	1
Podkarpackie	4	12	5	9
Podlaskie	5	8	3	7
Pomorskie	5	5	5	4
Śląskie	10	28	10	16
Świętokrzyskie	2	4	3	4
Warmińsko-Mazurskie	0	2	5	1
Wielkopolskie	3	12	8	8
Zachodniopomorskie	6	6	5	6
Łódzkie	3	3	3	3
None region	1	0		

Source: own elaboration, based on https://www.clustercollaboration.eu/cluster-mapping; Buczyńska et al., 2016

Comparing the number of clusters identified by PARP and the number of represented economic specialisations (Table 28), these are similar, which indicates that regional clusters are diversified. In Śląskie, but also to some extent in Lubelskie, Wielkopolskie, Dolnośląskie, Podkarpackie, some concentration of economic specialisation of clusters can be observed.

In Lithuania, clusters often operate in several industries (Vaiginienė, Nausėdaitė & Mažeikaitė, 2019). Most of them are active in such economic areas as *Professional, scientific and technical activities, Wholesale and retail (including repair of motor vehicles), Manufacturing, Education* and *ICT* (Vaiginienė, Nausėdaitė & Mažeikaitė, 2019, p. 25) (number of clusters according to NACE sections can be found in Appendix 6, Table 76). ICT and Education technologies are included in Lithuanian S3. Other activities are difficult to assign to S3 priorities straightforwardly.

In Poland, the following types of areas can be identified based on the data from the PARP report (Buczyńska et al., 2016, p. 35; p. 55):

1. Areas with a high number of clusters and high emerging potential (cluster initiatives) (e.g., ICT, Energy (including renewables), Tourism, entertainment, recreation, culture, Business services and education);
2. Areas with a high number of clusters and noticeable emerging potential (e.g., Construction (and architecture), Medicine, biomedicine and medical tourism, Metal industry);
3. Areas with several extant clusters that are rapidly growing (e.g., Food industry, Creative industries);
4. Areas with few extant clusters and noticeable emerging potential (e.g., Environmental protection, Transport and logistics, Aviation);
5. Areas with few clusters with no new cluster initiatives (e.g., Production technologies, Biotechnology);
6. Emerging initiatives with (e.g., Wood industry, Automotive, Pharmaceuticals, cosmetics).

Many of the areas mentioned above can be found as S3 priorities in Poland (e.g., ICT, Energy, Creative industries). Details on economic specialisation of clusters and cluster initiatives in Poland can be found in Appendix 6 (Table 77). Table 29 presents the number of clusters with excellence labels, indicating the quality of clusters in terms of services available to its members.

Table 29 – Cluster excellence labels (2020)

	Lithuania	Poland
Gold label	0	0
Silver label	0	4
Bronze label	5	17
Other	6	24

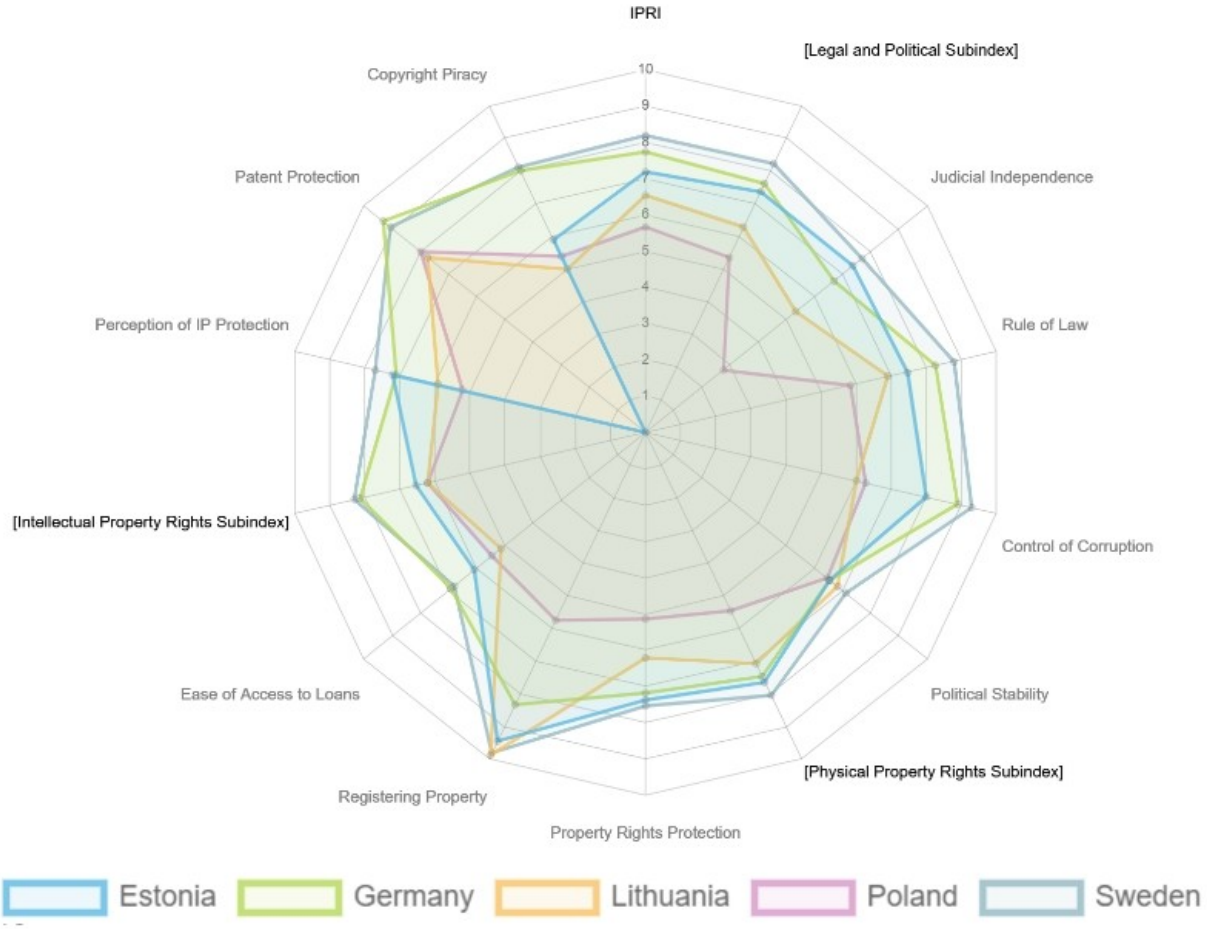
Source: own elaboration, based on https://www.clustercollaboration.eu/cluster-mapping

Two conclusions relevant to this thesis can be made from the statistics presented in this subsection. First, even though Lithuania and Poland have many clusters, these appear to be worse equipped than their counterparts in the leading regions. Their potential to support the implementation of S3 priorities appears weaker. In Poland, the potential of specialisations based on clusters strongly varies across regions. At the national level, cluster analysis has been not sufficiently addressed to ensure the full exploitation of their potential for S3, which is especially true for Lithuania.

3.2.3.2. Innovation friendly business environment for SMEs

Property rights, including intellectual property protection, might indicate how attractive the region is for innovating firms. *International Property Rights Index (IPRI)* (2020) ranks Lithuania 35 and Poland 58 out of 129 countries worldwide (Property Rights Alliance, 2020). Lithuania's main strength lies in registering physical property, occupying a top 10 worldwide. Regarding this aspect, in 2020, Poland occupied position 125, undoing immense improvements it made between 2007 and 2019. When comparing both countries' profiles on different sub-indices, it is evident that Poland scores much lower concerning the legal and political environment, which is mainly to the rapid drop of judicial independence after 2013. Figure 4 compares IPRI (the year 2020) in the selected countries.

Figure 4 – *Comparison of IPRI in selected countries*



Source: created on https://internationalpropertyrightsindex.org/countries#compare-panel

As shown in Figure 4, generally, Lithuania performs slightly better than Poland but still somewhat weaker than Estonia. Notably, Estonia comes close to the leading countries (Sweden and Germany)

in many sub-indices, except those related to intellectual property rights. Lithuania, and especially Poland, have more room for improvements concerning different subindices.

3.2.3.3. Research infrastructures

Both Lithuania and Poland have prepared national roadmaps for research infrastructures (Research Council of Lithuania, 2015; Ministry of Science and Higher Education (Republic of Poland), 2020). The comparison of the roadmaps and absolute numbers of available research infrastructures (Table 30) shows that Poland has higher potential, which is not surprising given the size of the economy and population in both countries.

Table 30 – Comparing research infrastructures

Lithuania	**Poland**
• "Social sciences & humanities (5); • Biomedical sciences (5); • Natural & technical sciences (10); • Agriculture sciences (1)."	• "Technical sciences & energy (14); • Earth & environmental sciences (5); • Medical, biological & agricultural sciences (16); • Physical sciences & engineering (23); • Social sciences & humanities (6); • Digital infrastructures (6)."

Source: own elaboration, based on Research Council of Lithuania, 2015, p. 2; Ministry of Science and Higher Education (Republic of Poland), 2020, pp. 2-3.

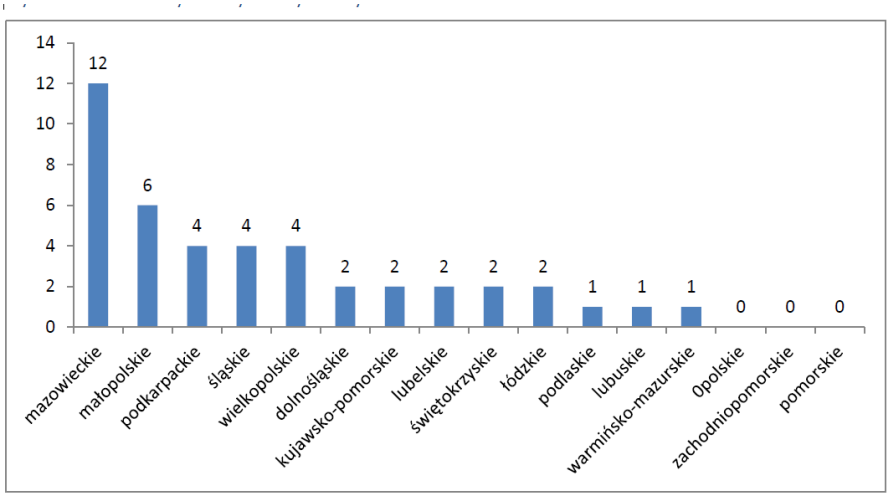
As shown in Table 30, both countries have the most substantial potential in natural and technical/ engineering related sciences. Besides, life sciences (e.g., medicine, biology, agriculture) have considerable potential in both countries. Social sciences and humanities have noticeable potential in Lithuania and are somewhat weaker represented in Poland, compared to other fields.

Research infrastructures in Lithuania have been developing around HEIs, which also strongly benefited from R&D&I policy support. The introduction of S3 shifted the focus towards R&I activities in the business sector. As a consequence, further research infrastructure development with the extraordinary engagement of HEIs became challenging. As noted earlier, research infrastructure in Lithuania has been developed mainly through the *Valleys'* initiative in the financial programming perspective 2007-2013, and the current objective is to facilitate its use.

Poland appears to have a somewhat more mature and developed research infrastructure compared to Lithuania, when it comes to business support institutions (e.g., technology parks). Among 59

organisations accredited by the Ministry of Entrepreneurship and Technology[7], 18 have been established before the year 2000 (Stowarzyszenie Organizatorów Ośrodków Innowacji i Przedsiębiorczości w Polsce [SOOIPP], 2018/2019). These organisations are also not evenly distributed across regions, as demonstrated in Figure 5.

Figure 5 – *Distribution of accredited Business and Innovation Centres in Poland*

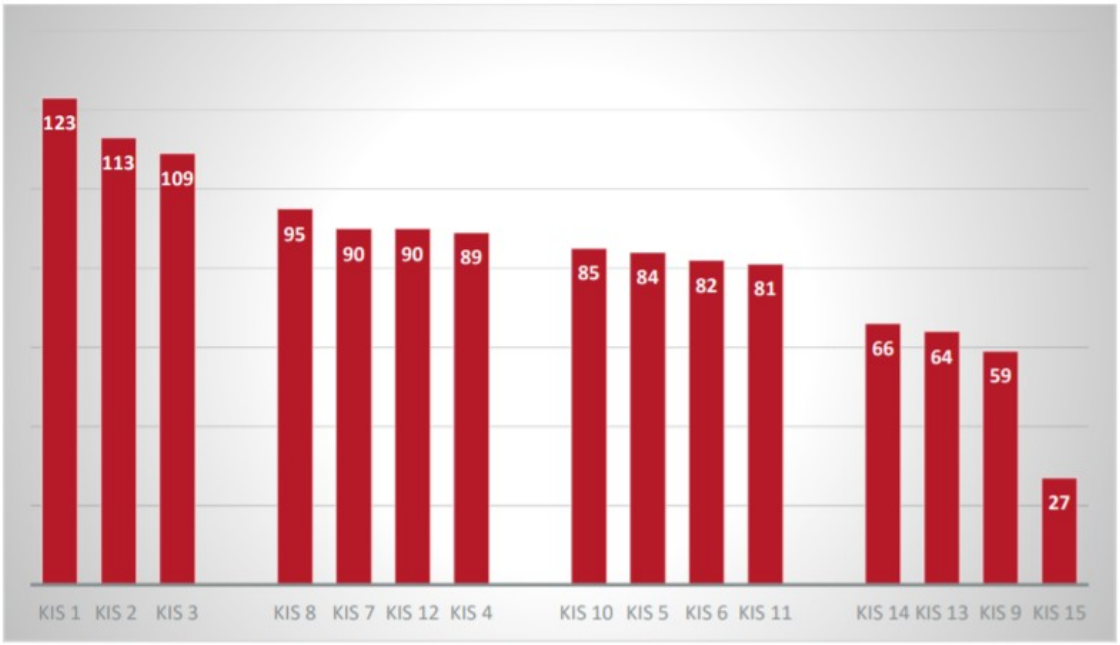


Source: SOOIPP, 2018/2019, p. 13.

The majority operate nationally (41%), regionally (39%), or locally (12%), with a small share of internationally active organisations (7%) (SOOIP, 2018/2019, p. 13). Noteworthy that the actual number of relevant organisation might be much higher. Thus, the study conducted by PARP (Gajewski et al., 2019, p. 7) included 169 innovation centres, among them 43 technological parks (25 of them had incubators), 64 incubators outside the parks, and 62 technology transfer centres. The study addressed the context of S3 explicitly and assessed how well the present infrastructure suits the needs of individual priorities. Results show relatively poor involvement of these organisations into S3, especially at the national level, where only 8% were involved in the working groups to define and monitor S3 (Gajewski et al., 2019). However, the contribution was better in the regions (22%). The report also notes that only about 1/5 of these organisations educate or inform stakeholders about S3. Gajewski et al. (2019) have also identified how many organisations could make up a background for specific smart specialisations. As Figure 6 demonstrates, sustaining potential varies amid national smart specialisations (KIS) (the figure refers to the list of specialisations valid in 2019).

7 The Ministry of Entrepreneurship and Technology was succeeded in 2019 by the Ministry of Economic Development, Labour and Technology

Figure 6 – *Organisations involved in KIS (National Smart Specialisation) governance in Poland*



Source: Gajewski et al., 2019, p.29.

However, the actual potential of these organisations to support chosen KIS is weaker than nominally visible, and it is most substantial for the following specialisations (Gajewski et al., 2019):

1. Healthy society (KIS1);
2. Innovative technologies, processes and products of the agri-food and forestry-wood sector (KIS2);
3. Biotechnology and chemical processes, bioproducts and products of specialised chemistry and environmental engineering (KIS3);
4. High-efficiency, low-carbon and integrated systems for the generation, storage, transmission and distribution of energy (KIS4);
5. Intelligent networks and information and communication technologies as well as geoinformation (KIS10);

The smallest actual infrastructure is available for KIS6 (Environmentally friendly transport solutions…), KIS9 (Sensors…) and KIS13 (Photonics) (Gajewski et al., 2019, p. 8). Notably, specialisations KIS9 and KIS13 have been joined into "electronics and photonics" specialisation with the update in 2020.

3.2.3.4. Universities and RTOs

As follows from the overview earlier in this chapter, by introducing S3, universities and RTOs should become less prominent stand, and enterprises get more in the focus of innovation policy. However, the academic sector still took part in defining S3 priorities, sometimes even more predominately than other stakeholders, as follows from the official documents, e.g., foresight reports in Poland (Polish Chamber of Commerce for High Technology, 2011a) and discussion protocols in Lithuania (STRATA, n.d.-b).

In Poland, the fourth axis of POIR offers support for science and RTOs when their projects match with S3. According to NCBR, the support measures of this axis aim to improve the quality of Polish science (Narodowe Centrum Badań i Rozwoju [NCBR], n.d.-b). It finances industrial R&D carried out by the science sector in cooperation with entrepreneurs and public research and development infrastructure (limited to projects included in the Polish Road Map for Research Infrastructure). As further stated by NCBR, the axis also includes support measures for consolidating the scientific potential and increasing the human potential of the R&D sector (for a detailed list of measures, see Table 75 in Appendix 5). The targeted audience includes (NCBR, n.d.-b):

- Research units and consortia of research units;
- Consortia of enterprises and research units;
- Scientists;
- Students;
- PhD students;
- University technology transfer centres and special purpose partnerships.

In the broader perspective, universities may also benefit from the support within the first axis of POIR, which finances business R&D that is based on the results of scientific research conducted at HEIs.

In Lithuania, many support measures targeted research and higher education institutions and the public sector. These included measures aiming to *promote the use of existing and new RDI infrastructure, enhance knowledge commercialisation and technology transfer,* and *strengthen skills and capacities of the public research sector* (Visionary analytics, 2017, p.2). Additionally, nearly half of the support measures aiming to *enhance RDI activities' intensiveness in the private sector* target joint projects, including the *Intellect* support measure, which has nearly half of the total

budget dedicated for this aim (Visionary analytics, 2017, p.2). A detailed list of measures is presented in Appendix 5, Table 74.

3.2.3.5. Digital Agenda for Europe

Digital Economy and Society Index (DESI) orders Lithuania around the European average (14 out of 28 in 2019) (European Commission, n.d.-f). Its particular strengths lie within digital public services and the integration of digital technology by the business, ranking well above the EU's average (8). Weaknesses lie in connectivity and human capital, where the country ranks below the EU average (positions 26 and 19, respectively).

Poland ranks 25, close to the lower end of DESI and scores below the EU average on all DESI sub-indices. Poland made the highest progress within connectivity but remained behind the EU average within this subindex. The most significant weaknesses include the integration of digital technology by enterprises and human capital. Poland reaches its highest placement within the subindex of digital public services, ranking 23 out of 28 in 2019.

Both Lithuania and Poland included ICT in their S3 priorities. In Lithuania, initially, ICT was in the priority field with transport and logistics and was distinguished as a separate priority after updating S3. The priority includes distinct areas (for details, see Table 72, Appendix 4). In Poland, at the national level, it is a priority in the horizontal field of innovative technologies and industrial processes. Many regions also included ICT in their S3 priorities, either as sectoral or technology focus or as a horizontal specialization, supporting the development of other priorities. Thus, ICT use can also be noticed in other priorities (both in Lithuania and Poland) because of their broad applicability. However, neither country included a chapter on digital growth in their official S3 documents or elaborated on how the DESI index may affect S3, addressing countries' strengths and weaknesses. There are also no notions that the ministries responsible for national broadband strategy and policy had been involved in the S3 development process. In Lithuania, the Ministry of Transport and Communications, with two other entities under its command, are responsible for shaping and implementing relevant policy and the national broadband strategy (European Commission, n.d.-a). In Poland, the main actor is the Ministry of Digital Affairs, while the Digital Poland Project Centre and The Ministry of Funds and Regional Policy are responsible for funding (European Commission, n.d.-b).

3.2.3.6. Key enabling technologies

Key Enabling Technologies Observatory (KETs Observatory) monitors the KET performance of countries. „The composite indices rank the countries involved in the analysis on their performance regarding the different dimensions of technology maturity and market applications of KETs in 2015" (Key Enabling Technologies [KETs] Observatory, 2018a, p.2; 2018b, p.2). The indicator includes technology development, trade, and production. KET performance is measured among 25 EU countries (without Cyprus, Luxembourg and Malta). Table 31 summarises KET performance in Lithuania and Poland.

Table 31 – Overall KET performance ranking (EU 25)

	Lithuania	Poland
Advanced materials	17	4
Advanced manufacturing technologies	14	17
Photonics	10	11
Micro-nano electronics	12	17
Nanotechnology	21	12
Industrial biotechnologies	11	13

Source: own compilation from KETs Observatory 2018a; KETs Observatory 2018b.

KETs Observatory also evaluates the framework conditions concerning the development of KETs in different countries. Table 32 summarises these for Lithuania and Poland.

Table 32 – Framework conditions in Lithuania and Poland

Lithuania	Poland
Strengths	
• Very open economy with a high percentage of foreign trade. • Regional leader for bandwidth and fibre-optic infrastructure. • Excellent university-business collaboration in R&D. • Companies can claim back 25% of R&D infrastructure costs and 50% of R&D activity costs. • Strong performance in digital infrastructure with the overwhelming majority of enterprises using broadband internet and various software solutions	• The competitive manufacturing sector, in particular in the field of high and medium high-technology products • Strong position in high-knowledge market services • Access to a well-educated and relatively low-cost workforce • Access to relatively performant digital infrastructures • Supportive framework for start-ups in the IT sector
Areas for improvement	
• Businesses have difficulties finding suitable skilled labour. • Weak taxation policies do not facilitate enough inclusive growth. • Access to finance constraints some high productivity firms. • Innovation intensity of Lithuanian firms is low.	• Limited product and process innovations from SMEs • Further spending in R&D from both the public and private sectors • Further efforts to support the uptake of advanced technologies by manufacturing SMEs • Further efforts to improve access to financing to private companies, in particular, SMEs • Relatively lack of cooperation across the value chains and relatively weak innovation ecosystems • Improving the overall competitiveness of the research system

Source: own compilation from KETs Observatory 2018a; KETs Observatory 2018b.

3.2.3.7. Cultural and creative industries

Both in Lithuania and Poland, the cultural and creative industries are present within priority fields. In Lithuania, it is the field of *Inclusive and creative society*, which includes *design and audiovisual media technologies and products* and *social and cultural innovation for the development of societal development products and services, innovative business models* (STRATA, n.d.-d; European Commission, n.d.-d). In Poland - *Intelligent creative technologies* in the horizontal field of *Innovative technologies and industrial processes* (Ministerstwo Rozwoju, 2020; European Commission, n.d.-d). Some regions in Poland also included cultural heritage into their S3. However, both countries apply the same policy mix for all their priorities, which might miss accounting for these specialisations' specific needs and address their innovation process. In such context, the best chances might have projects that link with some technical solutions in ICT, food technologies or

others. No comprehensive measures or initiatives linked to S3 and targeting specific needs of these industries could be identified during this study.

3.2.3.8. Internationalisation

The internationalisation aspect might be crucial for the small countries, as already discussed in the systematic literature review on S3. However, in Lithuania, it has been addressed rather superficially. The only financial instrument, which addresses internationalisation explicitly, targets rather public research sector than SMEs. The instrument supports the commercialisation and internationalisation of Science, Technology, and Experimental Development (STED) results. It aims to enhance knowledge commercialisation and technology transfer and strengthen the skills and capabilities of the public research sector. An elaborated list of support measures is available in Appendix 5. The situation looks somewhat better in Poland. Support for internationalisation activities is available through POIR and targets innovation in firms (details to POIR support measures provides Appendix 5).

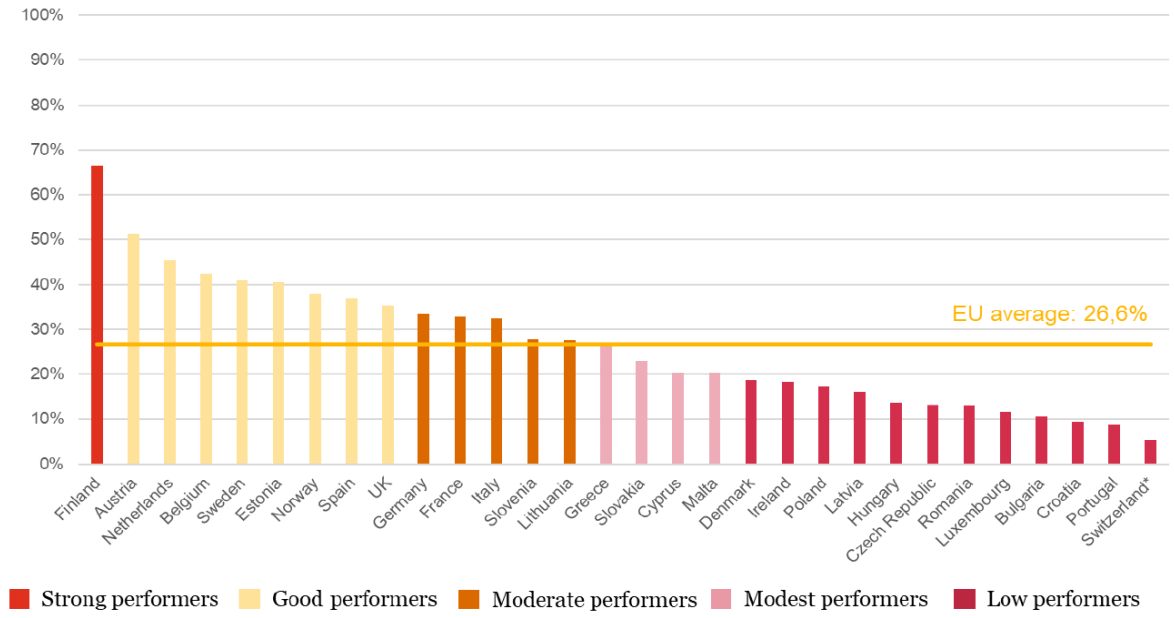
3.2.3.9. Financial engineering instruments

Lithuania did not include financial engineering instruments into the policy-mix portfolio. Poland included several of these instruments into POIR, as can be seen in Appendix 5. These aim to support R&D activities in enterprises (R&D financed with capital fund participation), support technology transfer and open innovation, and several instruments to support innovation in enterprises.

3.2.3.10. Innovative Public Procurement

According to the national innovation procurement policy benchmarking across Europe, Lithuania is at the European average and occupies place 14 out of 30 (EU 28, Switzerland, and Norway) (European Commission, Directorate-General for Communications Networks, Content and Technology [DG CNECT], 2021). Thus, Lithuania is listed among moderate performers (available categories: strong, good, moderate, modest, and low). Poland ranks 21 and qualifies as a low performer. Figure 7 depicts the position of countries according to the innovation procurement policy frameworks.

Figure *7 – Ranking of countries based on innovation procurement policy frameworks*



Source: European Commission, DG CNECT, 2021, p.24.

Table 33 compares the strengths and weaknesses of Public procurement for Innovation (PPI) in Lithuania and Poland.

Table 33 – Comparing strengths and weaknesses of PPI in Lithuania and Poland

Lithuania	**Poland**
Strengths	
Lithuania's innovation and public procurement policy framework recognises the strategic importance of innovation procurement, solidified in a spending target. Lithuania has set up capacity building and assistance activities and some financial incentives for the first set of pilot PCP projects.	There is a rising awareness of the strategic importance of innovation procurement in horizontal enabling policies in Poland. Innovation procurement is put forward as a strategic priority in the public procurement, innovation and economic policy, and ESIF funding is being mobilised for innovation procurement.
Weaknesses	
Potential synergies with other horizontal and vertical policies are underused. Lithuania does not have any specific action plan or monitoring system for innovation procurement, and currently, all main actions are still limited in scale. Lack of IPR policy in public procurement that encourages innovation.	Innovation procurement is not strategically taken up yet in sectorial policies to move to wide-scale implementation across all sectors. Capacity building and assistance measures are not mainstreamed widely yet. The action plan, spending target and monitoring system is lacking. Lack of IPR policy in public procurement that encourages innovation.

Source: own compilation from European Commission, DG CNECT, 2021 (Annexes: Country profile Lithuania, Country profile Poland).

In Lithuania, innovative public procurement is included in the policy mix under the measure *pre-commercial procurement* (Ikiprekybiniai pirkimai LT). At the national level in Poland, although not explicit, it can be applied under the sub-measure *innovative research management methods*, which was the case, e.g., in the field of coal energy (Narodowe Centrum Badań i Rozwoju, n.d.-a).

3.2.3.11. Green growth

Both Lithuania and Poland included specific energy-related priorities into national S3, focusing on renewable energy sources. In Poland, some regions also chose green-growth related priorities, e.g., "Green Economy" priority in Śląskie, focusing on green technologies in different economic sectors. Therefore, from the perspective of the policy documents and declared priorities, the theme has been adequately addressed.

3.2.3.12. Social innovation

Social innovation aspects received relatively little attention in Lithuania and Poland when designing S3. However, Lithuania and some regions in Poland recently started paying attention to social innovation (predominately related to healthcare) and engaged in policy learning. Lithuania participated in the Interreg Europe project HoCare project, focused on "delivery of innovative solutions for home care by strengthening quadruple-helix cooperation in regional innovation chains" (HoCare, Interreg Europe, n.d.). Furthermore, Lithuania and Podkarpackie participate in the PASPARTOOL project, focusing on the "key tools to assess and improve soft innovation policies", including monitoring social innovation. Dolnośląskie has been involved in the TITTAN project, aiming to establish a "network for technology, innovation and translation in ageing" (TITTAN, Interreg Europe, n.d.). In the S3 update from 2020, Lithuania mentions social innovation in the priority „inclusive and creative society" description: "social and cultural innovation for the development of societal development products and services, innovative business models" (STRATA, n.d.-d; European Commission, n.d.-d). At the national level in Poland, social innovation is included in the fourth priority axis of the POWER (eng.: Operational Programme Knowledge, Education, Development) in the financial programming perspective 2014-2020 (https://www.power.gov.pl). However, the latter programme is not directly related to S3 and smart specialisations.

3.2.4. Summary

Table 34 summarises countries' assessment results based on six steps of the RIS3 Guide. Each step included three dimensions, and addressing them is valued with one point each.

Table 34 – Six steps of S3: comparing Lithuania and Poland

	Six steps assessment	
Step	**LT**	**PL**
Analysis of the regional context and potential for innovation	2	2
Governance: ensuring participation and ownership	1	2
Elaboration of an overall vision for the future of the region	2	2
Identification of priorities	1	1
Definition of the coherent policy mix, roadmaps and action plan	1	2
Integration of monitoring and evaluation mechanisms	2	1

Source: own elaboration, based on European commission, 2012; S3 Platform, n.d.

To sum up the assessment results from Table 34, at the national level, Lithuania and Poland are similar in terms of:

1) Analysis of the regional context and potential for innovation;
2) Elaboration of an overall vision for the future of the region;
3) Identification of priorities;

Some differences may be observed in the following:

1) Governance: ensuring participation and ownership;
2) Definition of the coherent policy mix, roadmaps and action plan;
3) Integration of monitoring and evaluation mechanisms;

Generally, at the national level, Poland did somewhat better at governance and ensuring participation and on policy mix, while Lithuania did better in monitoring the development of specific priorities. Table 35 summarises similarities and differences between Lithuania and Poland regarding EDP's initial outcomes (mainly from the prioritisation exercise) and challenges in place.

Table 35 – Outcomes and challenges: comparing Lithuania and Poland

Similarities	**Differences**
Outcomes	**Outcomes**
1. Broad lists of priorities: six fields and 20 priorities in LT, five fields and 20 priorities in PL; 2. Same support measures for all the priorities; 3. Smart specialisation strategy viewed as a criterion for the eligibility for funding.	1. One level strategy in Lithuania and two-level strategies in Poland; 2. In Lithuania, monitoring is mainly quantitative. In Poland, qualitative interviews are more extensively used; 3. In Lithuania, STRATA became highly in charge of coordinating innovation policy design even though it is not free eligible to implement its own choices as it is acting on behalf of ministries and government.
Challenges	**Challenges**
1. Difficulties with engaging business; 2. Little attention to the fourth helix; 3. Leadership within specialisations.	1. In Poland, additionally challenge to align monitoring at the national and regional level; 2. Poland has smart-labs as a part of the monitoring, which seemingly is not practised in Lithuania.

Source: own elaboration

Apparently, not all the steps have been equally well elaborated in the extant documents. Thus, reports on the analyses and their results have been widely available. The reasons for the specific governance arrangements could be not made explicit from the available documents. The aspects relating to vision have been addressed superficially. Prioritisation and priorities have been addressed most thoroughly and were a central element of the official S3 documents. Policy mix and related implementation documents have often been prepared separately and coordinated by different departments or administrative units than those responsible for prioritisation and stakeholders involvement in EDP. Finally, the issues relating to monitoring and evaluation received little attention during the prioritisation process and have been left to develop later. Hence, in the official S3 documents, these aspects are discussed superficially. Consequently, the approach to monitoring can be analysed mainly based on the monitoring reports, which vary in their scope and regularity across countries and Polish regions. Table 36 summarises key insights on the thematic S3 issues in Lithuania and Poland.

Table 36 – Thematic issues: overview

Thematic issue	Lithuania	Poland
Clusters and smart specialisation	- No information on clusters in the S3 documents.	- To some extent addressed in the analyses at the national level; - Clusters-based approach in some regions, e.g., Podkarpackie, Pomorskie; - Clusters are not evenly distributed and concentrate in some regions.
Innovation friendly business environments for SMEs	- Good conditions considering physical property rights, weaker in legal and political aspects (particularly control of corruption) and intellectual property rights (compared to the countries chosen for the benchmarking: Germany, Sweden, Estonia).	- Falls behind leading countries in all aspects (compared to the countries chosen for the benchmarking: Germany, Sweden, Estonia).
Research infrastructures, centres of competence and science parks	- Centred around HEIs.	- Diversified infrastructures; - Unevenly distributed across regions; - Variable potential to support individual specialisation (some can be better backed than others).
Universities and RTOs	The academic sector is actively involved in S3.	The academic sector is actively involved in S3.
Digital Agenda for Europe	Close to the EU average.	Below the EU average.
Key enabling technologies	KETs are addressed in priorities.	KETs are addressed in priorities.
Cultural and creative industries	Present in the S3 priorities.	Present in the S3 priorities.
Internationalisation	Addressed in the policy mix.	Addressed in the policy mix.
Financial engineering instruments	Not included.	Included into policy mix.
Innovative public procurement	Explicitly included in the policy mix.	Implicit in the policy mix.
Green growth	Included in S3.	Included in national S3 and also in some regions.
Social innovation	No specific focus of S3.	No specific focus of S3.

Source: own elaboration

As shown in Table 36, there is much resemblance concerning thematic S3 issues and their context in both countries. Thus, clusters and RTOs have been less involved than universities. However, these types of organisations are also relatively young and underdeveloped in both countries, compared to their counterparts in more innovative regions. Also notable is that specific themes, such as KETs, cultural industries, green growth, and social innovation, are approached similarly in both countries. Themes, which might be less immediately associated with high-technology and R&D but rather

with a broader view of innovation, were treated just as other priorities (e.g., cultural industries) or addressed on the surface (e.g., social innovation). Similarities and differences between the two countries are outlined in Table 37.

Table 37 – Comparing thematic issues

Thematic issue	Similarities	Differences
Clusters and smart specialisation	- Clusters are young; - Compared to the leading countries in innovation, there is a higher number of clusters per inhabitant, but clusters are weak, offer fewer facilities.	- Poland addressed clusters during S3 analyses at the national level, while in Lithuania, such notions are lacking. - Lithuania has higher potential in terms of high growth firms per inhabitant in traded clusters. - Poland's advantage is based on a high number of firms, but growth is less prominent.
Innovation friendly business environments for SMEs	- Compared to the leading countries (e.g., Germany, Sweden) and Estonia, the business environment is less favourable.	- Compared to Poland, Lithuania comes closer to the leaders in many aspects. - Compared to Lithuania, Poland has the most deficits concerning physical property rights and legal environment.
Research infrastructures, centres of competence and science parks	- Little involvement in S3.	- Poland has more mature, diversified in terms of facilities, and developed infrastructures than Lithuania.
Universities and RTOs	- Academic sector actively participated in the analysis of the potential and prioritisation process.	- In Lithuania, policy mix has been less favourable for HEIs concerning science-business collaborative projects.
Digital Agenda for Europe	- Human capital and connectivity rank below the EU average.	Compared to the EU average: - Lithuania is strong in digital public services and digitalisation in the business sector; - Poland has no strengths.
Key enabling technologies	- Deficiencies in innovation among local firms.	- Lithuanian strengths are good infrastructures and university-business collaboration in R&D. - Poland's strengths are based upon workforce and manufacturing sector for high and medium high-technologies.
Cultural and creative industries	- Lack of tailored policy mix, same measures as for others.	- No substantial differences in the approach were observed.
Internationalisation	- Somewhat superficial approach during S3 development.	- In Lithuania, support is available for the academic sector, in Poland also for enterprises.
Financial engineering instruments	- Lithuania did not include these instruments into its policy mix portfolio while Poland did.	

Thematic issue	Similarities	Differences
Innovative public procurement	- Rising awareness and recognising the importance of innovative public procurement for innovation.	Lithuania is slightly more advanced than Poland: pre-commercial procurement has been explicitly introduced to the policy mix for S3.
Green growth	- Predominately connected to energy-related priorities; - Treated just as other priorities.	- No substantial differences in the approach were observed.
Social innovation	- Minor attention but slightly rising interest can be observed.	- No substantial differences in the approach were observed.

Source: own elaboration

As follows from Table 37, Lithuania and Poland have more similarities than differences concerning 12 themes. Differences are fine-grained and concern details. It can be assumed that countries have much in common concerning the environment for innovation and the context for S3. However, even minor differences might turn significant for implementing the S3 approach.

4. Research method

Döring and Bortz (2016) argue that it is not using numeric or verbal data, which determines whether research should be considered qualitative or quantitative, but rather the degree of structuring and standardising the research process, which results in collecting specific types of data. While quantitative research is highly standardised and structured, the qualitative research process is less standardised and structured and merely evolving in loops. In this sense, current research can be qualified as qualitative. The choice resulted from the topic's novelty, little empirical evidence, and the nature of the research problem and questions. The tradition within a chosen theoretical perspective (neo-institutional theory) and other studies' methodological choices with similar research settings have also determined this choice.

Additionally, a conscious choice of research approach may include considerations on the nature of knowledge one aims to obtain with its research and how it might be obtained. Such considerations are subject to the theory of science. The main areas of theory of science include *ontology*, *axiology* and *epistemology* (Döring & Bortz, 2016).

Ontology concerns the nature of the research subject: if it is perceived as existing independently of our consciousness, it is called *realism,* and in *idealism*, the reality is perceived as a particular vision (Döring & Bortz, 2016). Another question of ontology is whether reality can be traced down to particular antecedents, implying causality of outcomes, or is merely seen as an outcome of subjective motives, hence intentionality (Döring & Bortz, 2016). The assumption in the current research project derives from the structuration theory developed by Giddens, also reflected in the neo-institutional theory, which implies a combination thereof. On the one hand, some structures determine actors' behaviour, hence, cause outcomes. On the other hand, actors might choose their responses and shape the structures with time. Hence, intentionality exists.

Axiology reflects the researcher's values and ethical considerations during the research process (Döring & Bortz, 2016). Among core values during the research process have been ensuring transparency of the researcher's goals and causing no harm to interviewees. In the introductory e-mail, interviewees have been informed about the research background and approach to interviewing. It has also been clarified that the researcher would like to hear interviewees' experiences or opinions about certain aspects from the perspective of their work. Interviewees were informed that their opinions do not have to represent the official views of their organisations and

will be not presented as such. In compliance with ethical standards in academic research, interviewees were guaranteed that all the data collected during interviews would be used anonymously. Such an approach may also be beneficial to encourage genuine opinions. Interviewees were also asked not to hesitate to tell during the interview if they do not feel comfortable about particular questions or do not want to talk about specific aspects, so these could be omitted. Interviewees were also informed beforehand about the interview duration, and these time frames have been kept. Interviewees were also encouraged to inform the researcher if they could devote less time, therefore the interview guide could be adjusted. All the interviewees have been asked for permission to record the interview. Interviewees were encouraged to ask questions about the interview through e-mails and, before starting the interview, to clarify pending inquiries.

Epistemology relates to the considerations on the means to gain scientific knowledge, among which *deduction*, *induction* and *abduction* can be distinguished (Döring & Bortz, 2016). Deduction proceeds from general to detail and is often associated with quantitative research. In contrast, induction follows the opposite logic, moves from detail to general, and is considered the general qualitative research approach. Abduction is another approach that may be used in qualitative research. In contrast to induction, which focuses on recognising common patterns, the abductive process concentrates on the puzzling combination of characteristics and derives new hypotheses from the data (Döring & Bortz, 2016).

As noted by Bryman and Bell (2015, p. 392), distinctive features of qualitative research might be:

- Inductive approach, implying that theory is generated from the research;
- Interpretive approach (epistemology);
- Constructionist approach from the ontological perspective.

However, Miller and Glassner (2016) argue against the division between objectivist and constructivist approaches and advocate that in-depth interviews provide insights about what happens with individuals in their social worlds and how they make sense out of it.

4.1. Grounded theory

Inspiration for the research method adopted in this dissertation is the grounded theory approach, developed by Glaser and Strauss (1967) in their work "*The discovery of grounded theory: Strategies for qualitative research*". Subsequently, different streams have emerged within the approach, and these hold different assumptions on the research process.

As Bryant and Charmaz (2007a, pp. 2-3) note, the term *grounded theory* (GT) may be ambiguous when talking about research method as it actually refers to the outcome of the research process, and they suggest using the term *grounded theory method* (GTM) instead. In this dissertation, the term grounded theory refers exclusively to the method to avoid confusion and for simplicity reasons.

Hensel and Glinka (2018) name three principles of grounded theory:

1 Starting fieldwork without formulating hypotheses in advance,
2 Constant comparison and contrasting of collected data in order to develop codes and organise them into categories,
3 Theoretical sampling to expand understanding of the phenomenon under study.

As Hensel and Glinka (2018) note, generated theories can be classified as mid-range theories and be substantive or formal, where substantive theories refer to the specific empirical area (e.g., managerial education) while formal theories concern conceptual areas of research (e.g., socialisation). These theories differ in their level of generalisation and may intertwine within a study. A substantial aspect in the present study may be considered innovation policy-making, while the formal aspect may refer to institutionalisation.

According to Martin and Turner (1986), grounded theory is a valuable approach in numerous cases, e.g., pilot research, case studies, inquiring areas of organisation studies suitable for qualitative research, or when the researcher aims at systematic and precise collection of facts. Hensel and Glinka (2018) name domains of institutional work and proto-institutions as suitable examples for qualitative inquiry.

4.2. Data collection

Assumptions on how to approach the data collection in grounded theory research have changed since the seminal work of Glaser and Strauss (1967). As Bryant and Charmaz (2007b, pp. 31-32) note, „for many researchers […] the method revolves largely around a very limited reading of *The Discovery of Grounded Theory* […] which in its minimal form comprises the claim that *theory emerges from the data*". It implied that the researcher had to approach the field without prior knowledge and step away from reviewing the literature before the research, which can be deemed as a „common misassumption" (Suddaby, 2006). The grounded theory also assumed that the

researcher approaches the field with an open mind and without formulating hypotheses, which may be seen as naïve (Charmaz, 2007; Hensel & Glinka, 2018). Thus, Hensel and Glinka (2018) note that researchers should appreciate to what extent their interpretations reflect reality and anticipate the influence of their perceptions, beliefs, and preferences.

For the purpose of this dissertation, data collection and reviewing the literature co-occurred in an iterative process. The research process resembled a dialogue between the insights from existing theory and those that emerged from the data. Therefore, reviewing the literature served as one way to triangulate the credibility of collected evidence and insights from the data. Triangulation of data, methods, investigator or theory may be applied to guarantee the credibility of collected evidence (Hensel & Glinka, 2018).

The grounded theory approach follows the principle of "*constant comparison*, in which data are collected and analyzed simultaneously, and *theoretical sampling*, in which decisions about which data should be collected next are determined by the theory that is being constructed" (Suddaby, 2006, p. 634). As a result, the sampling process is ongoing, and participants may be added to the study as it evolves (Suddaby, 2006; Bryman & Bell, 2015). The grounded theory implies that the research process may last until „theoretical saturation" is recognised, that is subsequently collected data within a particular category provides nothing new, different dimensions of a category are well elaborated, or the relationships between categories are distinct and valid (Bryman & Bell, 2015, p. 433). The principles of „constant comparison" and „theoretical saturation" inspired the research approach. However, it is beyond the scope of a single thesis due to the complexity of the research topic to achieve „theoretical saturation" on every aspect covered. Instead, collected evidence might be deemed sufficient to answer the research questions comprehensively and provide an elaborated solution for the research problem. Therefore, the study's outcome might be a starting point for further inquiries.

4.3. Data sources

This study's data were collected from different sources: interviews, official documents, reports, internet websites, and other sources relating to the smart specialisation strategy in Lithuania and Poland. Secondary data sources are also used to provide background information for Lithuania and Poland.

4.3.1. Secondary data

There are several reasons for including secondary data in the analysis. Firstly, the data reflect a situation in Lithuania and Poland concerning local preconditions to implementing S3 and EDP in line with the guidelines defined by European Commission and elaborated in the RIS3 Guide. Secondly, they provide the context for the data collected through interviews. Accounting for the context of specific actions is essential to correctly interpret the events and avoid misunderstandings of meanings (Miles, Huberman & Saldaña, 2014). The context might refer to the immediate situation or a broader social system, embedding actors (Miles, Huberman & Saldaña, 2014). The majority of the included secondary data stem from the organisations that are also engaged in the S3. Other part includes related documents from the peer-reviews, policy learning workshops, or rankings that might be used to assess the progress of specific S3 related themes, among other sources. Therefore, the data also served as preparatory material for the interviews. Thirdly, the use of secondary data enhances the reliability of research results through data triangulation.

Given the secondary data's role as contextual background, the relevant aspects of S3 determined the scope of its collection. Secondary data have been collected from numerous sources, in line with the six-step approach and additional themes covered in the RIS3 Guide. The approach allowed accounting for the context comprehensively and clarifying which contextual aspects have been addressed and to what extent.

4.3.2. Interviews

Interviewees were contacted by e-mail and asked for the interview while providing them with a brief background of the research. The indicative time for an interview, communicated to the interviewee while asking for an interview, was between one and one and a half hours. Interviews were conducted face-to-face or remotely (per telephone or online tools Skype and Zoom), in Polish or Lithuanian, recorded (with prior consent of each interviewee) and transcribed. All of the interviewees gave their consent to have the interviews recorded. However, notes were taken in parallel to ensure the availability of the data in the case of any technical problems.

The final decision upon place and time for the interview has been left to interviewees. Notes about interview date, time, place and other settings have been taken (e.g., any calls or other interruptions that distracted the interviewee from the narration). In the case of the interviews conducted remotely, any disruptions in the connection have been noted.

Scott and Lyman (1968) mention the problem of avoiding giving accounts when conducting interviews, where term *account* means a statement of a social actor given to explain unanticipated behaviour, either own or of others. Scott and Lyman (1968) distinguish two types of accounts: *excuses* (interviewee admits the act as being "wrong" but refuses to take whole responsibility) and *justifications* (interviewee takes the responsibility of the act, but does not admit it as being "wrong"). They illustrate it with an example of a soldier who may admit killing, and either recognise it as wrong, but see himself not responsible as acting "under order", or see the act of killing in this particular case as being right because the killed one was an enemy. Formulating excuses include: *appeal to accidents, appeal to defeasibility, appeal to biological drives, and scapegoating* (Scott & Lyman, 1968, p. 47). Excuses based on accidents work in the case when the accidents do not appear frequently. Excuses based on defeasibility include that there has been a lack of necessary knowledge or the interviewee has not been acting following their will (the will has not been "free"). Biological drives and scapegoating can be placed under a broader umbrella of fatality, hence if something went wrong, this is, e.g., because of human nature and nothing has been possible to do about this, when in the case of scapegoating, this is attested to the preceding behaviour or attitudes of others.

The insights mentioned above have been appreciated during the research process, ensuring interviewees anonymity to encourage them to provide an authentic and genuine account. It was explained that the purpose of the research is not to judge adopted approaches or someone's work but to understand antecedents for the success of S3 or why and where obstacles emerge. Interviewees were also encouraged to provide their personal opinion, ensuring that this will not be presented as an official view of their organisation.

If an interviewee asked for the list of questions beforehand, about ten to 20 general questions have been sent, though adjusted to the interviewee's background expertise. Simultaneously, the research approach has been explained, and the interviewee has been informed that it is vital for the research process to have a possibility to ask some follow-up questions based on the information received during the interview.

4.4. Sampling

The sampling method applied in this study can be classified as non-probability sampling and selection intended to maximise the variety. The study's sampling techniques include purposive sampling and convenience sampling using the snowball technique when interviewees recommend other interviewees. The sampling process is sequential, which is congruent with grounded theory principles. Nevertheless, in contrast to the rigorous approach to theoretical sampling, when participants are added exclusively based on categories that emerge from the data, in the present study, some initial criteria have been defined, namely, that different stakeholder groups should be represented. It is in line with *generic purposive sampling* (Bryman & Bell, 2015).

The reasons for choosing the sampling techniques are twofold: the need to access expert knowledge and the possibility of realising the selected sample. As interviewees are highly skilled and busy professionals with little time available, this should be appreciated. The snowball sampling technique allows access to the people with desired expertise and increases their readiness to participate in the research.

Researchers conducting qualitative studies struggle with determining sample size as there is little well-founded guidance in the extant literature regarding qualitative studies using interviews and non-probabilistic sampling (Guest, Bunce & Johnson, 2006). Guest et al. (2006) note that it is advisable to stop collecting data when the theoretical saturation has been reached, even though the notion of theoretical saturation in qualitative research is rather vague. There is no conventional agreement when it may occur (Guest, Bunce & Johnson, 2006). Guest et al. (2006) operationalise saturation as reaching the point when additional data collected brings no changes into the codebook. In the example study discussed by Guest et al. (2006), almost full thematic coverage of the data occurred after 20 interviews, where 80% of the codes were identified after the first six transcripts. Thus, after finishing interviews in one country, interviews conducted in other countries did not add substantially new codes, but just a few, accounting for some nuances specific to that different country. Guest et al. (2006) also conclude that 94% of most prevalent codes occur within the first six interviews and 97% within 12. Consequently, no substantial themes would be missed if no further interviews were conducted as the most critical themes emerged at the early stages of the analysis. Hence, when deciding upon sample size, necessary to reach saturation, the following aspects may be considered: homogeneity (similar participants, selected according to specified criteria), instrument content (*the more widely distributed particular experience or domain of*

knowledge, the fewer participants are needed), interview structure (asking participants same questions) (Guest, Bunce & Johnson, 2006, pp. 75-76).

As present study takes a system of innovation approach and aims to reflect different stakeholders' views, different actors should be represented. Therefore, some initial criteria for the sampling have been set. The sample should represent different actors involved in the S3 at different stages. These could be seen as the sub-populations that might be represented with their samples. Additionally, sampling should be considered separately for Lithuania and Poland, with the latter's regional sub-samples. Table 38 presents the sampling frame for the conducted interviews. Additionally, Appendix 7 provides an anonymised list of interviewees with general information concerning the interviews' date, means, and duration.

Table 38 – Interviewees and their organisations

Organisations	**Interviewees**	**PL**	**LT**
Supporting/consulting organisations (e.g., providers of analyses; strategy advisors, and management consulting)	Policy analysts, facilitators	2	2
Bridging organisations (between government, and business or science and business) (e.g. joint government and business initiatives focusing on innovation related issues; technology transfer centres at universities)	Experts, managing directors	2	3
Ministries, coordinating S3 (units related to innovation policy and support)	Managing personnel and experts	3 (1)	4
Implementing organisations, responsible for project evaluation/funding decision (e.g., agencies supporting business innovation, R&D, and entrepreneurship)	Managing personnel/experts in the support - coordinating units	2	3
Business representing organisations, Clusters, Business Valleys	Managing directors, experts	3	3
Science: Universities	Scientists	(5)	2
Regional level authorities (Poland only)	Managing personnel or specialists in charge of EDP	8	-
Total per country:		**20**	**17**
International experts	Involved in developing EDP concept and supporting infrastructure for experience exchange at EU level	1	
Total:		**38**	

Source: own elaboration

Table 38 presents the framework from which types of organisations interviewees have been sampled. However, when conducting interviews, it appeared that some interviewees had reach background and experience in other types of organisations or even were connected to multiple

stakeholders' groups (helices). Consequently, they could provide insights balancing different perspectives. Each interviewee received a code to ensure anonymisation when referring to the interview material and sample quotes. The coding should allow the reader to assess interviewees' background to the extent that makes it possible to evaluate from what perspectives the interviewee reflects. On the other hand, the code does not enable tracing back the interviewee's specific organisation or occupied position. Exhibit 2 describes the coding scheme for anonymisation used in the thesis. Appendix 7 lists the codes for each interviewee.

Exhibit 2 – Anonymisation scheme for interviewees

Interviewee's code:
Number + country code + stakeholder code

Country codes:
I – international (countries other than Lithuania or Poland);
LT – Lithuania;
PL – Poland

Stakeholder codes:
F – facilitation (people with different background, had a role of advisors, consultants, facilitators);
BS – boundary spanners (people with experience in different helices);
NG – national-level government sector (e.g., ministries, implementing agencies);
RG – regional-level government sector (regional authorities);
B – business (business stakeholders engaged in S3);
S – science (science stakeholders engaged in S3);

Source: own elaboration

The role of the state, represented by policy-makers, is crucial in the EDP. It includes organising and coordinating the process, facilitating search, assessing outcomes and ways to realise selected priorities. Due to this responsibility and tasks, this stakeholder group received special attention, and a relatively higher number of interviews has been conducted with the representatives.

4.5. Types of data and sample questions

Data collection through interviews has been pursued in three stages, as presented in Table 39. Each stage had particular purposes that reflect its main focus, though every mentioned purpose has been pursued through all the interviews. However, such an approach implies that interviewees were asked a broader range of questions during the first stage, and interviews covered a greater variety of themes. Interviews conducted during the second stage referred to more specific experiences, especially ways of stakeholder involvement and conducting EDP and relation of smart

specialisation to other policy initiatives and documents in the regions. During the third stage, interviews focused even more on specific aspects, such as, e.g., experiences of particular industries with S3, collaboration issues, or impact of S3 on project assessment. Secondary data have been collected continuously, parallel to the interviewing.

Table 39 – Stages of data collection and analysis

Stage 1 (2016-2018)	**Stage 2 (2019)**	**Stage 3 (2020)**
8 Interviews • 4 LT • 3 PL • 1 International	10 Interviews • 3 LT • 7 PL	20 Interviews • 10 LT • 10 PL
Purposes: - Contrast perceptions with versions presented in official documents and other published material; - Identify controversial themes;	Additional purposes: - Explore controversial themes; - Identify repetitive patterns;	Additional purposes: - Saturate selected categories; - Triangulate responses;
Official documents, reports, and other available material (e.g., press releases, published interviews, project descriptions, workshop materials and presentations, available online).		
Preliminary results	Initial results	Revised results
Descriptive-explorative: present different perspectives (stakeholders views)	Explorative-explanative: identify categories and relationships between them	Explanative: identify possible development trajectories and reasons behind them
At this stage, the S3 process has been explored from the perspective of different stakeholders' roles during different steps.	This stage has explored how different steps have been implemented in different regional/national contexts and what possibly led to the current state of S3 in the analysed setting. It has also been explored what solutions to emerging problems have been applied.	At this stage, results from stage 2 have been revised and verified. Additionally, learning processes and resulting avenues for further development of S3 in different settings have been tracked.

Source: own elaboration

The first stage of the interviews served primarily to collect initial information on the topic to triangulate it with the official statements and publications, describing the process of defining and an initial stage of implementing S3. These interviews were conducted between the end of 2016 and the first half of 2018. The interview guide included the following main themes: stages of the process, organisational/ governance aspects, and impact of collaboration. The first interviews included questions related to the different stages of S3 development, including the roles and experiences of the interviewees. In the case of non-government related stakeholders, this included a question on interviewees motivation to get involved in the process. Interview themes included:

- The emergence of the concept of smart specialisation in their field and design of the EDP;
- Defining smart specialisation strategy;

- The transition to the implementation phase and monitoring issues.

General inquiry questions included:

1. How has EDP been organised?
2. What has been done to include different stakeholders?
3. How have participants of the working groups been selected?
4. How broad participation could be ensured, and what were the challenges? What has been done to overcome them?
5. How active were different stakeholder groups during the meetings of working groups?
6. What were interviewees' experiences while working in the group: what were positive experiences, and what were difficulties?
7. How was it to work with other stakeholders? Whether the interviewee already have similar experiences?
8. What is the interviewees' opinion about priorities and their number?
9. How were financial support measures developed?
10. In interviewees' perception, how suitable are financial support measures to facilitate the realisation of priorities in their field?

Interviewees were asked about the continuity of the EDP and possibilities for feedback from different stakeholders during the implementation phase. Finally, interviewees have also been asked about the perceived impact of the exercise on collaboration and innovation policy coordination.

The interview guide also evolved as information and data gathered during the research process fed into questions for subsequent interviews. Some questions were dropped because the information gathered was deemed sufficient, and there were no contradictions between different data sources, or these have been cleared. An example is a question about the survey of different groups of stakeholders (science, business, and decision-makers), mentioned in the document labelled "Proposals on Lithuanian smart specialisation strategy priority directions" (Lithuanian: *Pasiūlymai dėl Lietuvos sumanios specializacijos prioritetinių krypčių*). According to the document, the survey has served as one of the information sources. However, interviewees were unaware of the survey, or they believed it was rather superficial and could provide little additional information. A question has also been dropped when it became obsolete because in the research process came out that the aspect has been wholly omitted/non-existent in the process. Such an example is a question about former experiences similar to EDP in innovation policy-making. While there have been sectoral

programmes in Poland, congruent with the principles of the EDP, no similar experiences could be named by the interviewees in Lithuania.

The second data collection stage aimed to identify the challenges encountered during S3 and whether these could be solved in the interviewees' view. During this stage, interviewees have also been explicitly asked about possibilities to utilise other regions' experiences from their own countries or abroad. They have been asked whether they knew some inspirational examples of good practices or explicitly knew some "good practices" applied in their setting. Interviewees have also been asked about their participation in various events (forums, workshops, experience sharing or consultation events) with peers from other regions, what use, in their opinion, these events have and how different formats are perceived.

The third stage of interviews aimed to enhance understanding of why certain solutions might or might not be applied in a given context. The questions focused on what has changed after introducing S3 and whether interviewees deem it feasible to introduce specific solutions that they know from other regions or countries or develop shared standards. In these interviews, interviewees elaborated on different contexts in their country or region, which, in their opinion, enabled or inhibited specific approaches.

4.6. Data analysis

Data analysis might represent three activities: data condensation, data display, and conclusion drawing and verification (Miles, Huberman & Saldaña, 2014). In the current research project, grounded theory techniques have been used for the data analysis. Bryman and Bell (2015, p. 586) present the following levels of coding in grounded theory as developed by Corbin and Strauss:

1. Open coding is the first stage of coding, focusing on breaking down the data, examination, comparison, conceptualisation and categorisation. This stage allows developing the concepts that may be later grouped into categories at a higher abstraction level.
2. Axial coding means putting the openly coded data together in a new way so that the links between codes and contexts, consequences, causes and patterns of interaction emerge.
3. Selective coding allows selecting core categories, i.e., main topics, relating to other categories and providing the findings' framework.

Analysis of different types of data followed a different approach. Thus, secondary data, which mainly served as a contextual background, has been analysed in the "top-down" manner, which means that categories have been predetermined and data described these categories. Analysis of interviews followed the organic "bottom-up" process, where categories emerged from the data. The following subchapters provide details on the analysis of the specific types of data.

4.6.1. Analysis of secondary data

The amount of collected secondary data has been extensive because many available documents and reports contained comprehensive analyses and detailed information to support policy-makers or other organisations in their work. Not every information from these sources has been immediately relevant for this study. Therefore, for this research project, the data have been reduced at the analysis stage, selecting the most relevant aspects, summarising them, and categorising them based on the themes presented in the RIS3 Guide.

Secondary data served as a contextual background and as supplementary material for the interviews. Therefore, its analysis has been limited to a descriptive presentation of relevant contextual information using graphs, displays, and tables.

4.6.2. Analysis of interviews

In the first coding step, transcripts have been coded using *QDA Miner* software, paragraph by paragraph. To every paragraph, a code has been assigned, and these have been attributed to overarching categories. The second and third coding steps have been conducted using a conditional relationship guide and reflective coding matrix tools. A conditional relationship guide has been developed by asking the following questions to each of the categories:

1. "What is [the category]? (Using a participant's words helps avoid bias.)
2. When does [the category] occur? (Using "during…" helps form the answer.)
3. Where does [the category] occur? (Using "in…" helps form the answer.)
4. Why does [the category] occur? (Using "because…" helps form the answer.)
5. How does [the category] occur? (Using "by…" helps form the answer.)
6. With what Consequence does [the category] occur, or is [the category] understood?" (Scott, 2004, pp. 115-116).

Appendices eight, nine, and 10 include relevant materials to understand interviews' analysis and theory generation. Thus, Appendix 8 lists the open codes. Appendix 9 depicts their organisation within the conditional relationship guide, and Appendix 10 presents the reflective coding matrix.

The data analysis process resulted in an initial framework, organised around the core category, which emerged as a repetitive pattern around different themes and contexts present in the research material. After the initial framework of the emerging theory was developed based on the steps mentioned above, it was revised, enriched and verified with additional collected data. Findings have also been contrasted with extant literature, connecting them to relevant theoretical concepts to ensure validity and reliability. Selected concepts describe similar phenomena in different research settings, explain particular findings, or supplement them with additional insights.

4.6.3. Framework for data analysis

The data analysis has been undertaken parallel to collecting further data, initially restricted to open coding and moving to the axial coding when some more extensive data have been collected. After conducting interviews or during the coding process, memos have been written to keep track of immediately emerging ideas and observations. Additionally, comments have been taken during the first coding stage when thoughts or questions concerning some paragraphs emerged. These short comments are known as *jottings* and might be a part of the analytic strategy (Miles, Huberman & Saldaña, 2014). Selective coding was done when the two first stages of data collection had been completed. The third wave then served to saturate and eventually revise the categories.

The study seeks to assess EDP principles' institutionalisation at different stages of smart specialisation strategy in Poland and Lithuania regarding scope, inclusion, continuity and outcomes at particular stages during the EU financial programming perspective 2014-2020. Therefore, initial criteria have been defined to assess the degree of institutionalisation of the EDP principles and S3 approach. Criteria to determine adoption and entrenchment of the S3 approach have been developed in line with the framework proposed by Zeitz et al. (1999) and aim to evaluate institutionalisation across five proposed bases:

1. Modelling (mimetic pressures):
    - There are examples of "best practices" that participants recognise;
    - Participants aim to imitate these practices/models;
2. Culture (identities, communicated via formal and informal mechanisms):

- S3 and EDP principles are reflected in the official communication channels (e.g., websites);
- Participants advocate why S3 and EDP approach is suitable for their region;

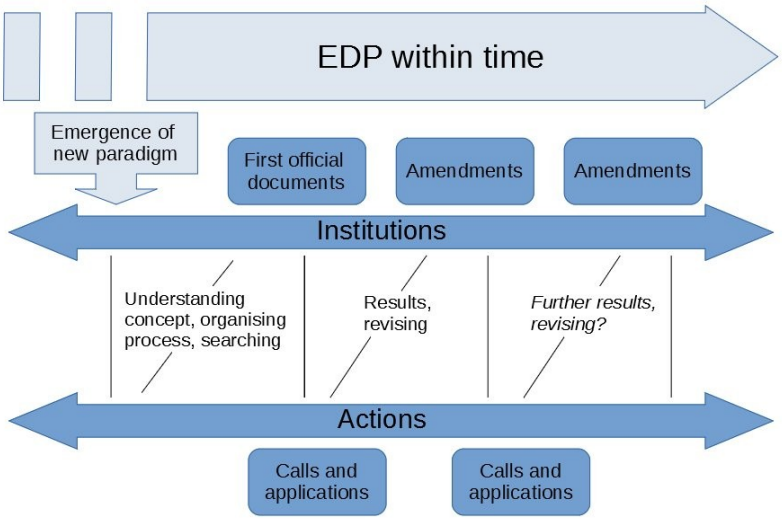
3. Education (normative pressures):
   - There are available peer meetings/ conferences/ workshops or other activities, enabling sharing knowledge and experiences;
   - Participants take part in these activities;
4. Regulation (coercive pressures):
   - There are official requirements to carry out EDP and develop smart specialisation strategies;
5. Technical rationality (perception of measurement effectiveness):
   - There is an established monitoring process/ regular evaluations are carried out;
   - Stakeholders can provide feedback during the evaluation process.

For the analysis, the following stages of the EDP and S3 approach have been defined:

1. Before S3 (approximately up to 2009-2010);
2. Emergence of a new paradigm (approximately 2009-2012);
3. Process of defining smart specialisation strategies (approximately 2012-2014);
4. Emergence of the official documents related to the smart specialisation strategies (2014);
5. Implementation (from 2014 onwards);
6. First evaluation reports (2016-2018);
7. Process of reviewing the smart specialisation strategies (approximately 2017-2018);
8. Amendments (official documents) (approximately 2018 onwards).

Figure 8 depicts the process' chronology, which may be viewed through the lens of the theoretical framework proposed by Barley and Tolbert (1997) and Jarzabkowski (2008).

Figure 8 – *Entrepreneurial discovery process – the framework for analysis*



Source: own elaboration

5. Findings

The chapter introduces findings from Lithuania and Poland. It consists of four subchapters, each ending with a comparative summary and preliminary propositions for theory.

Firstly, explicating how S3 governance structures and institutional arrangements have been set might be essential to understand how the environment for institutionalisation emerges. Consequently, subchapter 5.1 outlines the main elements of the governance structure and discusses related activities, such as directing EDP and involvement of stakeholders and their roles, based on the perceptions and opinions of the interviewees. The three themes emerged as overarching categories in the coding process and reflect how S3 structures develop. Hence, the subchapter aims to answer the research question "How did the preparation of the official S3 documents evolve in Poland and Lithuania, including the implementation of the Entrepreneurial Discovery Processes (EDP)?". Accordingly, the subchapter outlines the establishment of an environment for institutionalisation, defined as an organisational field. It also discusses the role of different stakeholders and their attitude towards S3, answering, "What characterised the relationship of different stakeholders to the smart specialisation development process?".

Secondly, it is crucial to evaluate whether the introduced S3 approach becomes embedded in everyday institutional routines and taken for granted across stakeholder groups and policy levels. In other words, whether S3 is being implemented in line with its initial assumptions. Subchapter 5.2 describes how the initially pre-defined structures might determine the direction of search through EDP and affect its outcomes. The subchapter aims to answer the research question "How did both countries progress from the S3 planning to the implementation stage?".

Thirdly, given the paramount role of actors in the institutionalisation process, understanding the mechanisms that shape their relationship to S3 bears important insights concerning dynamics between compliance with initial assumptions of S3 and decoupling. Subchapter 5.3 elaborates on the mechanisms that affect the diffusion of S3 initial assumptions, answering the question "How has the relationship evolved?"

Fourthly, it might be helpful to analyse institutional pillars of coercive, mimetic and normative isomorphic pressures separately to explain the links between antecedents and their consequences. Therefore, subchapter 5.4 addresses how specific context affects institutionalisation outcomes in the

light of specific isomorphic pressures. It aims to answer four research questions on isomorphic pressures and their impact on institutionalisation. Finally, the subchapter elaborates whether S3 assumptions have been institutionalised or decoupling and divergence between the declared and the practised can be observed, answering the last research question.

5.1. S3 and emerging structures of an organisational field

The subchapter addresses the environment for institutionalisation and outlines the formation of organisational fields around S3 in Lithuania and Poland. Further, it also addresses the critical question put forward by Boxenbaum and Jonsson (2017) concerning relevant dimensions for isomorphism (where similarity ought to be observed).

The subchapter starts with discussing activities that determine S3 governance structures. It covers the issues of multilevel governance and alignment of administrative capacities, the role of sectoral dimension in the governance structure and balancing the impact of different stakeholders to ensure inclusion and commitment to the strategy. During the analysis process, these issues could be grouped under the *place-based* or the *sectoral* aspect of governance.

In this context, the place-based aspect of governance reflects issues relevant at different territorial and administrative levels understood in a vertical manner (i.e., progressing from international towards national, regional, and local). In other words, the place-based aspect relates to the S3 as a multilevel strategy, which requires specific arrangements and bears certain challenges. Thus, multilevel governance predominately concerns the issues related to public administration and governance at the specific territorial level, including challenges related to administrative capacity. The sectoral governance aspect relates to business stakeholders' role and challenges for their inclusion and commitment to the strategy.

Further, the subchapter outlines how the setting is defined where the relationships between actors might emerge. It indicates the dependence between the direction of search through EDP and initially pre-defined structures. It also illuminates the selection process of initial priority fields, constituting a structure for further search of new opportunities. The subchapter also reflects how those structures draw boundaries and indicate where potential relationships between actors should emerge and

thrive. Moreover, it also elaborates the possible influence, which stakeholders' engagement and power they hold might have on the emerging field structures. It sketches how the combination of perceived roles, power configuration, and dominant logic determine the institutional setting in the emerging organisational field.

The subchapter is structured as follows: the first section describes activities in Lithuania, and the second section – in Poland. The identified activities are comparable for Lithuania and Poland. However, there are some differences in details. The last section summarises the main findings for both countries in a comparative overview and concludes with propositions based on the findings from both countries.

5.1.1. Lithuania

5.1.1.1. Governance structures

5.1.1.1.1. Place-based governance dimensions

Multilevel governance is one aspect when considering S3. Initially, it appeared not relevant in the Lithuanian case. However, the topic emerged in connection with distributing funds. Lithuania had only national level smart specialisation during the financial programming perspective 2014-2020 and launched calls available to all potential beneficiaries, regardless of their location within the country. For the new programming period of 2021-2027, it is planned that priorities remain the same countrywide, while some calls would only be available to potential beneficiaries from outside of the metropolitan regions:

> *In the new period of structural support, we have capital-region and the region of central and western Lithuania. There are two regions. We are currently looking at regional analysis, i.e., we look at the region' strengths, weaknesses, and priorities that might be strong in one county or weaker in another county. We will write a programme based on this and probably form measures accordingly. That is still happening. We are looking at it from a regional perspective.* (32-NG-LT)

It could enable less innovative, "lagging" companies to gain funding in a less competitive setting while also allowing them to apply for the more ambitious calls in the central funding schemes. Another interviewee elaborates on the rationale behind regional level funding, tested in the redesigned measure "Experiment" to support joint business-science projects.:

> [Regional funding baskets] *may have led to greater support only for companies in the respective county competing with each other and for those regions to receive funding. The fact with R&D is that companies in big cities, which naturally carry out innovative activities and are better prepared, have more experience, better access to research institutions, universities - in the majority claim and have priority* [to get funding]. *Regional companies focus more on traditional business activities rather than on some R&D&I or long-term perspective. The company needs to survive. Therefore, R&D&I longer-term*

> *projects were dominated by big-city representatives. 70% of the invitations were from Vilnius, Kaunas or Klaipėda, and only a small part was from the region.* (38-NG-LT)

As can be concluded from the quotes above, territorial units are not evenly developed concerning innovation potential, even in a small country like Lithuania. Therefore, selecting an appropriate territorial level for support might be necessary to avoid sharpening core-periphery division within the same country.

Another governance challenge for the Lithuanian S3 stems from the fragmentation of the innovation system, which results in unaligned administrative capacities. The fragmentation causes challenges in the context of financial programming generally, and specifically S3. In the best case, unaligned administrative capacities add bureaucracy without providing additional value for the stakeholders, as the following exemplary quotes affirm:

> *At the same time, there were also joint projects* [a support measure "joint science-business projects"]*, signed by both ministers. In that sense, we did not get anything different from that. There was a joint instrument, two ministries* [involved]*, and the two ministers' signatures for the joint science-business projects. However, since each ministry is responsible for its own money, it has to do it anyway. As a result, two of these documents are created and combined, just more bureaucracy. These are the decisions, whether one or two, actually it does not resolve much.* (25-NG-LT)

> *Applications are incoming for the two ministries. I do not know if they have any material* [from each other]. *The meetings of the two vice ministers, Economy and Education, were very interesting. How strangely they communicate. Here is mine, here is yours, this is not happening.* (28-S-LT)

Notably, fragmentation and unaligned administrative capacities in Lithuania emerge across different levels, which might cause barriers to cooperation. Even if formally organisations cooperate and know their responsibilities, this is not always clear for the customer:

> *In short, I would not say that there is a reasonable culture of collaboration. Maybe there are too many institutions. The most important thing, for the customer, it is too much. It is not clear what is being done and whom to turn to. Even if it is clear, there are differences in treatment, procedures, flexibility, permission to correct, etc. In short, it is not much cooperation, and there is such more tacit non-cooperation. Formally, working together is obvious to everyone.* (36-NG-LT)

Not aligned administrative capacities may require additional coordination and cause delays in the policy process, which becomes clear from the following elaborations. The first quote relates to specifying policy mix for S3 on the example of the roadmaps that were supposed to outline how priorities could be implemented:

> *If I remember, in autumn 2013, the roadmaps were urgently requested. They appeared at the beginning of 2013 or 2014. Since then, we have not participated in group activities and everything we did here anymore. In that sense, it was cut off, but it still stood for two years. Two years, because the institutions* [the interviewee means government organisations] *were explaining something to each other, the funds stood still. Thus, it happens every period. We have more than one programming* [period] *in the box. It was the same in 2007, and it was the same before. Because just by going into such technical details, there are descriptions of tools and so forth, and everything stands still.* (22-F-LT)

An alternative example provides the quote from the discussion on the need to establish technology transfer centres.

> *It took somewhere three to four years to agree with the Ministry of Finance, which is abnormal. They demanded co-financing from the business everywhere. Why business has to co-finance a university unit's activities, let us say, an institute unit? For the next* [programming] *period, technology transfer centres are already being talked about as a much-needed thing. Nevertheless, we have lost the whole period for that.* (24-NG-LT)

Persisting fragmentation, combined with the need for coordination to align administrative capacities and avoid duplication, requires extensive cooperation between organisations and can be resource-consuming. Thus, public administration has to work on additional internal agreements and tracking mechanisms to ensure transparency and control of procedures throughout the system (already mentioned issue of bureaucracy):

> *Cooperation is taking place, and we are often confronted with those organisations that present similar measures or even sometimes present the planned measures together. We have signed such cooperation agreements between those organisations to prevent double funding. There is the thing going on, and it is important to prevent certain things or to assess where the applicant has been presenting, where he is going, whether he will receive that funding. There is reasonability in it, and that cooperation was ongoing and needed on some issues.* (38-NG-LT)

Unaligned administrative capacities may cause outcomes similar to those that resemble the étatiste governance model, as defined by (Pierre & Peters, 2005), as illustrates the reflection below:

> *I think there is a great deal of inertia because the inherited institutional approach is narrow. It has been going on for many decades, the process has been pushed a bit, but then old habits have bounced back. Because the institutions* [interviewee means government organisations] *are fighting, for example, for resources, for the programmes, to exclude each other. They do not see that broader picture. They seem to have the most important thing here, which is the big problem. It is hard to tell what will break it all and stick together again as other countries do. It is an enormous challenge, very difficult to do. To do that requires very strong political will, and it is very hard to reach a consensus. That is why we move in such small steps, and sometimes we are still falling back.* (22-F-LT)

To sum up, S3 governance in Lithuania is not balanced across territorial levels. Even though policy-makers recognise the need to adjust policy to the regional level, S3 has been coordinated at the national level in the financial programming perspective 2014-2020. Whether and how regional authorities could take part in the process remains unresolved. On the other hand, administrative capacities at the national level are fragmented and lack alignment. There is an impression that several public organisations are responsible for the same issue, but cooperation and coordination still need improvement. Consequences are additional bureaucracy, delays, inefficient use of resources due to possible duplication or additional coordinating activities, and diminished transparency for the customer.

5.1.1.1.2. Sectoral dimension in the governance structure

Two following quotes illustrate the emergence of the sectoral governance issue in Lithuania. They reflect the insufficient capacity of policy-makers to understand specific needs and developments within multiple technological sectors and bring up the idea of appointing *facilitators* who would be experts in their domains:

> *A work of this scale is impossible to do. Here we need to learn every area. It is not enough to know in general. There are such different areas as health and lasers. One cannot know equally* [well] *and understand what potential there is. It is inevitably the need for resources there. We are talking about the idea of facilitators in the area who would be knowledgeable in science and business and could play such a facilitation role. Encourage projects, see what the area is, make suggestions. It could not be arranged somehow before the funding* [started]. (25-NG-LT)

The quote below is even more explicit about the importance of understanding specific technologies concerning their commercialisation and application in specific domains:

> *The case is that there is no such thing as a responsible facilitator, whether it is a coordinator or a person in charge of developing the individual priorities or emerging technologies. When one creates it and uses it, let us say biotechnology for the food industry and the environment, or wherever, one must accomplish it first. When Šikšnys or Klimašauskas cut that genome with scissors, one can implement that principle everywhere if one could industrialise it. I think that is a weak point, although formally everything is fine. The weak point is, in my understanding, facilitation.* (24-NG-LT)

As another interviewee noted, lack of deep understanding of sectoral specificity makes it problematic to plan sectoral development and implement tailor-made policy solutions, e.g., by launching calls to the specific sectors:

> *If we start in each technology sector programming some development path, then we have to agree very carefully. When politicians start to deliberate on sectoral development, I do not know if that can help. I am not sure if it makes sense to make highly targeted calls unless one works very closely with that sector and knows it very well. It means that there are people who know specifically about that sector, are already in the ministry, and talk to it on a daily basis. Because otherwise, there is a superficial trying to catch some trend. A deeper understanding of what is going on or an insight is not there, and one needs to hire consultants. The consultants make a document that captures something for a moment and draws something to come. After that, a year or two pass, and it is no longer clear who is responsible for that process. There should then be a long-term commitment.* (34-B-LT)

The quote above clarifies that inclusive policymaking, such as implied by EDP, might be an appropriate solution. However, it is not easy to implement in the current context. Another interviewee also elaborated on the role of sectoral leadership in the process, as demonstrates an exemplary quote below:

> *I think leadership and facilitation are very important. The motivation of the same groups also depends a lot on the facilitator. For example, if field leaders are invited to a discussion, they spread the word to the broad field, continue to lead in other areas, and motivate them to participate. Of course, I would recommend gathering those facilitators not from bureaucrats and politicians, as they used to be, but from the business or some consultative community with business connections and direct involvement. I have had a great deal of work with the film and audiovisual sector over the last five years. Design and the audiovisual sector are priorities for smart specialisation. I saw all these issues reflected in the sector, what they think, how they connect to the cluster, refined that whole value chain, integrated into foreign*

> *networks, and refined their products. It becomes very clear where state intervention is needed. I think the people who know the process very well are needed, with the skill to moderate and a very good understanding of the content.* (37-BS-LT)

Thus, it is not enough to gather people together. There has to be someone who can motivate a particular group of actors to work towards a specific goal, which appears only possible when the leader understands the domain. Thus, the quote above specifies the activities actors do to develop their domain: *cluster, refine value chain, integrate into networks, refine products*. Another interviewee refers to a different sector (photonics), where additional facilitation is unnecessary, in the interviewee's view. The quote below indicates possible antecedents of functioning self-organisation, determined by the sector's characteristics in the region. These are, e.g., the relatively *small size of the sector,* with *established links, lack of* direct *competition for markets* and being part of the same *value chain*:

> *We do not lack facilitation communicating with each other, and when the need arises, we get together quickly because we all know each other. We are familiar. Perhaps another important thing is that in reality, there is almost no competition in markets for products because the sector is not large in terms of its sales, and everyone works in particular niches, almost in particular niches. A large part is* [dependent] *on each other. Some make some products, and others make other products, then sell them to those larger companies, put them together. It comes out in the sense that this is the product, and there is no market competition. There is competition for people, good employees, which is natural.* (30-B-LT)

Thus, from the two quotes above, it becomes evident how crucial mutual dependence and lacking competition are for successful cooperation within a specific domain. Notably, not every S3 priority domain in Lithuania has such preconditions. However, policy-makers are aware that some sectoral leadership is needed for an ecosystem or *micro-cosmos for innovation*, envisioned by S3, to emerge. As pointed by another interviewee, such practices as an *orchestrator* are applied in other places. The interviewee refers to the *leader for everyone* as a possible solution and refers to Finland's example.:

> *Now companies operate somewhat individually, each in their ecosystems, clusters operate in a somewhat more associated structure. Associations may unite companies in each sector to some extent. However, there was no such thing as a leader for everyone. Attempts will now be made to experiment with this option because, as far as I know, there has been an orchestrator's role in Finland for a very long time, who should orchestrate that ecosystem and try to concentrate it somehow.* (33-NG-LT)

The quote below depicts the main challenges for the inclusive process in Lithuania. It becomes evident that merely involvement of business is not sufficient if the influence has to be balanced. Hence, a more nuanced view of the participants' background and representation issues is required:

> *Getting business involved is always very difficult because one does not reach all of it. Besides, sectors and people that can be very important do not have the time and do not agree to participate. In setting up expert groups, the aim was to attract such people who would see not only their sector but, more broadly, the entire market. MOSTA* [Mokslo ir studijų stebėsenos ir analizės centras] *made up these expert groups, and it was about ensuring diversity as much as possible that there would be no such thing as high*

> *technology alone. As far as I know, the experts involved have already consulted with their people through business associations, but that just was such a compromise.* (22-F-LT)

Further, the interviewee elaborates on how the balance of interest has been solved in Lithuania's case by selecting two working group leaders. However, even when formally equal possibilities for participation are in place, factors as a balanced mix of business and science within a priority domain and experience in cooperation with other stakeholders or participation in similar processes may affect the actual balance of influence during the exercise.

> *To avoid that only scientists or only entrepreneurs dominate the discussion, each group had two leaders. One was from science, the other from business, to maintain proportionality. Still, because the nature of the priorities themselves is different, some were more scientific, because science in that field alone is stronger than business, a complete balance may not have been achieved. Scientists have much more experience participating in discussions with the state than business, except for the high-tech sectors, such as biotechnology, lasers* [that] *are used to participate. To everyone else, traditional industries, it was brand new, and it was very difficult to attract those people. The coordinators of that process, MOSTA specifically, did everything they could. Well, let us say a person who has to be involved* [into the process] *has to go into business for their own affairs, then another* [person] *comes. It was the iterative process, it was not ideal, but they were working on it as much as possible.* (22-F-LT)

However, even minor involvement of broader groups of stakeholders might leverage influence. The following quotes refer to the usefulness of the survey that has been part of the Lithuanian S3 exercise. Although many deemed the survey as superficial and of little use, the interviewee reveals a positive side:

> *Still, one can not say nonsense because more people will speak. One sees people draw attention to this or that. It means the opinion is common. We all work with society like this. We get a sketch. The starting position was good, and it was fun to start working. I remember the first meetings. One sees those will not calm down anymore. They will prove because they know what to say and how to talk. One does not know where to pull the arguments from. Others are quiet and will stay away.* (28-S-LT)

Thus, as described in the quote above, information from the survey representing a broader group of actors could provide an argument to move away from the influence of well-organised interests towards a more balanced approach.

Table 40 summarises the main challenges concerning governance structures in Lithuania and solutions that have been applied to address them.

Table 40 – Summary: governance structures in Lithuania

Component	Identified challenge	Solution (applied or envisioned)
Place-based governance structure: Establishing multilevel governance and aligning administrative capacities	- Uneven chances for companies from different territorial units, which could impair regional development possibilities	- Funding at the regional level should ensure better support for firms from structurally weaker territories
	- Duplication of efforts, delays and bureaucracy without added value in the public administration sector due to fragmented innovation system	- Formally, cooperation and coordination exist, but inertia does not allow reforming and simplifying the system, which affects policymaking
Setting **sectoral governance structure** and balancing influence	- Lack of sectoral leadership impairs the development of selected specialisation domains	- Organising technologically competent stakeholders (business) around selected domain;
	- Policy-makers lack knowledge of technological domains, therefore are not able to compensate for missing sectoral leadership in the selected specialisations	- Successful example demonstrates self-organisation in a "niche" sector when cooperation is based on complementarities and shared interests of the actors and relies upon already established networks between people; - Public administration considers appointing a "leader" with a broad range of skills (knowledge of technological domain; networking capabilities; organisational and leadership skills)
	- balancing influence between different stakeholders within priority domain (concerns academia, business), given their different capabilities to participate in the discussions	- Appointing two working-group leaders: academia and business; - Attempt to involve a broader range of actors (even with tools ensuring minor impact, e.g., questionnaires)

Source: own elaboration

5.1.2.2. Relational structures and institutional arrangements

Developing S3 has been a unique exercise in the Lithuanian context. Usually, interviewees could not name any similar initiatives (even though some perceived C*omplex National Programmes* as a similar initiative, it did not affect the development of S3). The perception is well demonstrated by the quote below:

> *Since this was the first action of its kind in the European Union, particularly for the new member states, it was a new thing. There was neither an evident tradition nor a methodology to prepare such a document in various countries, including Lithuania.* (27-S-LT)

Thus, the policy-makers could not build on former experience when designing the process and consulted many experts for help. In such a case, the advantage is that there is no bias towards

existing practices. Hence, the process can be designed according to the requirements. Therefore, a proper understanding of the requirements might be crucial. The quote below proves that, initially, EDP had been perceived holistically, not limited to the priority-setting, but also considering the implementation system. This view is in line with the S3 assumptions. However, at the end of the quote, it becomes apparent that lack of experience may lead to unsatisfactory results if the time for learning is lacking.

> *The government took such a reasonably neutral position and allowed the ministries concerned to organise themselves as they saw appropriate. That is why the process was not interrupted strongly at first, but only at the end pressure sped up. I think there was enough freedom to do what seemed appropriate, but since that process took a long time, the pressure to end those results sooner began. As a result, some bad things happened. The implementation system was longer looked at, how to do better and change it.* (22-F-LT)

In the context of the quote above, it is important to note that experts prepared a foresight-based methodology to ensure an inclusive process in compliance with the requirements. The process has been well documented, including discussion protocols of the working groups. All the documentation has been made available on the website, dedicated to S3. There is no single strategic document in Lithuania that would present all the process steps. Instead, numerous documents refer to different aspects of the strategy. These are listed in Table 41. Priorities and their implementation have been coined in the legal acts (government resolutions or rulings), where priorities are named, responsibilities defined, and goals' monitoring targets set.Therefore, the initial S3 development process can be deemed very transparent. Still, the pressure to finish the exercise quickly negatively affected the results, especially at the later stages of EDP, as mentioned at the end of the quote above.

Table 41 – Foresight-based process in Lithuania

Stage	**Document**	**Aspects Covered**
Pre-S3 (Report of an expert group to the Ministry of Education and Science and Ministry of Economy of the Republic of Lithuania)	A contribution to priority setting for future research, studies and innovation in Lithuania, Technopolis Group (2012).	Background information on current Lithuanian strengths and emerging potential, with further steps for the priority selection process.
Background Analyses: S3 first stage of the process (four background discussion papers)	1. Research potential in Lithuania, Valinčius (2013). 2. Current strengths and future growth potential in Lithuania's economy, Martinaitis (2013). 3. Long-term national challenges facing Lithuanian economy and society, Paliokaitė (2013). 4. Global trends and drivers as challenges for Lithuanian R&I policy, Technopolis Group (2013)	Thematic reports covering research and economic potential as well as national and global challenges in the context of innovation and R&I policy

Stage	Document	Aspects Covered
Selected six priority fields (a result of the first round of the priority selection process)	Proposals for Priority Fields of Smart Specialisation in Lithuania, International Group of Independent Experts (2013).	The report presents selected priority fields and describes document preparation, focusing on analyses and stakeholder involvement. It advises continuing EDP and elaborating priorities within selected fields.
Methodological guidelines for EDP within priority fields, aiming to select priorities and agree upon their implementation measures (roadmaps)	*MTEP ir inovacijų prioritetų identifikavimo metodika*, Martinaitis et al., (2013). [Methodology for identifying R&D and innovation priorities]	Explains S3 requirements for priorities and presents EDP methodology for the second round
Thematic group discussions (four discussions within each of six priority fields), based on thematic evidence	23 discussion protocols (4*6) (one protocol not available); thematic reviews (6) and reviews of the potential (6) for every priority field	Include lists of participants, tackled questions, main issues raised. Reviews present priority field overviews and point out available research and business potential in the fields.
Selected priorities within six priority fields (a result of the second round of the priority selection process)	Proposals for RDI Priorities. Updated and amended report, Visionary Analytics (2013a).	The report presents selected priorities and describes the document preparation process, with a focus on analyses and stakeholder involvement. It advises continuing EDP and elaborating priorities within selected fields.
Roadmaps to implementation	*Prioritetų įgyvendinimo kelrodžiai*, Visionary Analytics (2013b) [Roadmaps for implementing priorities]	The document presents implementation plans (roadmaps) for the selected priorities.

Source: own elaboration, based on SRATA, n.d.-b; STRATA, n.d.-e.

Table 41 listed documents, which present S3 development through EDP in a well-elaborated way. Interviewees could not provide any additional information on how specialisation has been selected that would go beyond what is available in these descriptions and the academic literature on Lithuanian S3. The quote below summarises how the search directions in Lithuania were set:

> *The very first steps were to form a group of experts, large enough, wide one. At the same time, we hired several experts, whom we also helped, but we did not want it to be done alone with our hands. They did reviews. There were overviews of scientific potential, of business, and global and Lithuanian challenges. We gave all three reports to that group, to this collective one. Then there were many discussions, and the group that worked for a while concluded that we should have the six directions of smart specialisation that Lithuania has. There were still many perturbations because we coordinated with the ministries, and we changed, exchanged everything, had connections with the Valleys, coordinated with the European Commission and so on. Nevertheless, that direction was confirmed. Then we formed groups of experts in separate directions, who were thematic people, and those thematic people suggested priorities within those directions, which is the basis of our smart specialisation.* (23-NG-LT)

The overview of the documents (Table 41) and the quote above demonstrate how analyses and expert reports channel EDP towards distinguished fields. Notably, experts distinguished the relevant fields but advised to continue the process. Thus, the groups for further discussions have been formed for the pre-defined domains.

Table 42 summarises the challenges and solutions concerning relational structures in Lithuania.

Table 42 – Summary: relational structures in Lithuania

Component	Challenges	Solutions (applied or envisioned)
Relational structures	- Designing EDP in line with requirements set by EC, given the lack of previous experience with participative and inclusive approaches;	- Asking for expert help to design an appropriate methodology;
	- Channelling EDP in line with existing potential and ensuring that selected priorities can be implemented;	- Expert knowledge to distinguish relevant domains, accessed through reports and foresight methods; - Preparing implementation roadmaps, with detailed steps for priority implementation and specifying necessary resources.

Source: own elaboration

5.1.2.3. Power structures and field logics

As noted before, there was no general tradition of participative policymaking in Lithuania. Therefore, established public organisations that would have the experience to facilitate such processes have been lacking. Responsibility was designated to *Mokslo ir studijų stebėsenos ir analizės centras* (MOSTA), which also sought help from external experts. At the beginning of S3, there was freedom in conducting EDP. Hence, MOSTA could use the power vacuum and design the process as deemed appropriate. It was evident that, because of EDP and the nature of S3, stakeholders' engagement and willingness to cooperate are paramount to the outcomes. However, their involvement was challenging, and the importance of some stakeholders was insufficiently anticipated when the process started. So, the quotes below reveal the relatively vague involvement of some relevant state organisations at the beginning of S3 development. However, after selecting priorities, the authorities responsible for the implementation and allocation of funds got involved:

> *That may have been the original plan* [the involvement of implementing organisations into EDP]*, but the implementation issues were not very important at the early stages. There have been technology groups under consideration, which ones have the greatest potential, etc. The organisations implementing this policy had little to do there. They watched a little, but minimally. The involvement of policy* [implementing] *organisations became important when the roadmaps emerged. Then there was the debate about these priorities, what kind of means are* [appropriate] *for them and what to do. There has already been discussion on roadmaps when the authorities began to involve. However, it was precisely here that the government told, as far as possible, to deliver the result quickly.* (22-F-LT)

The quote above shows how stakeholders' involvement depends on their ability to engage in the discussion and the agenda's relevance for their work. As outlined earlier, policy-makers lacked technology-related knowledge, and the need for leadership from the industry emerged. The quote below demonstrates the division even more clearly:

> *The Ministry of Economy was most actively involved. Well, I do not know if it depends on people. The Ministry of Education and Science also came to the one or the other* [working group meeting]*, but they walked more or less the same* [people]*. So, let us take the next step now. The agencies showed up at the last meeting, and, when they came, they told us how things would be here. They were not much involved in this process.* (28-S-LT)

The following quote illuminates the perception of policy-makers of their roles and the focus on their field:

> *We have different people in charge of different areas. The content department shapes innovation and technology policy, human resource policy. This* [S3] *is the industrial policy to shape, and they were there. A team of them* [participated] *all along in working groups that involved business and science. However, those who were funding did not participate. Because going there was from the thematic specificity, from that theoretical level. When the department works with the Structural Funds measures, people cannot be experts in energy, biotechnology or something else. Well, it is natural that they did not participate in it.* (26-NG-LT)

Thus, the interviewee asserts that each department has its role and sticks to it. There is little understanding of what others are doing. However, it is also seen as natural not to get involved beyond own expertise, understand what might be crucial for specific priorities, and discuss with other stakeholders what measures might be necessary to facilitate the development in the specific domains. Still, the lack of involvement of relevant stakeholders may negatively affect the strategy-ownership perception, as indicated in the following quote:

> *The Ministry of Finance was one of those players, which, I have to admit, maybe we have got them involved not enough from the beginning because no one thought they were so important in this process. The Ministry of Finance is the institution that ultimately coordinates all European funds. For them, this process seemed a bit meaningless. Instead, they finally got tired of waiting, and they said, "that's it, give us the result", and they did not go into too much detail but somehow tried to make everything as simple as possible.* (22-F-LT)

The quote above also demonstrates how complex and intertwined S3 might be concerning relevant actors, which implies considerable mapping efforts to identify the relevant stakeholders and their roles and influence. Furthermore, the weak link between stakeholders responsible for the content of strategies and those who coordinate funding might impede smooth transition from priorities to implementation, as indicated in the interview's excerpts and the discussion above.

In Lithuania could be noted an established self-perception of policy-makers as administrators. This perception is common among public servants. It comes in the form of sayings during interviews, e.g., *I do not know about specific technologies. I am merely an administrator, a public servant*. It also shows how responsibility is shared: other sectors may know what to do, and administrators supervise and ensure that everything runs smoothly concerning regulations.

The view of the self as an administrator may be partly congruent with EDP assumptions that stakeholders search for opportunities and policy-makers find ways to facilitate their implementation. State organisations attempt to remain in the administering role while designating some bodies to take responsibility. It is currently STRATA in Lithuania, which evolved from the analytical body under the Ministry of Education, Science and Sport to the Strategic Analysis Centre under the Government. STRATA organises EDP and monitors S3. However, it may also not have sufficient capacity to compensate for the lack of leadership and support development within specific specialisation domains. Hence, even though it has a facilitating role, the need for facilitators and leaders from the business community emerges. Simultaneously, calls for excellent expert knowledge in the specialisation domains rise.

Such a clear delineation of roles and responsibilities may bear the risk of a discontinuity. Thus, extant state organisations have defined responsibility fields. The policy-makers may provide freedom of action for other stakeholders when tasks are beyond those fields. Hence, fields with an unclear responsibility compose *empty spaces* characterised by a power vacuum. Then, to fill the *empty spaces,* the responsibility might be assigned to existing or newly established state organisations or outsourced to other stakeholders, e.g., due to coercive pressure in EDP's case. The discontinuity in the process emerges when one group's activities, e.g., working group's, move into the responsibility field of extant state organisations. An example may serve the preparation of the roadmaps in Lithuania. Continuing EDP, stakeholders entered the responsibility field of organisations designing financial support measures and distributing public support. Consequently, a discontinuity occurs when the actors who perform different tasks within S3 are guided by different institutional logics that do not intertwine. It may be seen as the deficits in relational structure between relevant actors.

Another crucial aspect is policy-makers' organisational capacity, which might depend on their competencies and the coupling structure within the *government helix*, enabling coordination between all the relevant organisations. Deficits in relational structure might induce the disadvantages of a fragmented innovation system. The interview excerpts below reveal the fragmentation of the Lithuanian innovation system. In the first quote, the interviewee believes that stakeholders' involvement may have compensated for the fragmented innovation system but still acknowledges the need to address the issue:

> *It* [fragmentation] *had almost no effect at the defining stage because we had the opportunity to involve many people broadly. Because no matter how many people were there, they were involved. The agencies involved in the coordination and those involved in funding were also present. Regarding coordination,*

> *when we get the map of agencies and distribution of functions, many people do something in the innovation system. It is a lot. It should be addressed somehow. Now everyone consults everyone.* (23-NG-LT)

The quotes below help to understand the issues related to the relational structure within public authorities. It might appear lacking at the beginning, and despite initial impulse provided by S3, still deficient:

> *When it lasted* [S3 exercise]*, it looked like those contacts had been made. The state organisations had learned a great deal because they saw live who was working in the field. So far, there was no discussion, and it was strongly emerging then. Today, it is difficult to say whether any further development, communication, cooperation has come out of all this. Inter-organisational cooperation increased, but there are still many problems, and fragmentation has unequivocally persisted. For example, we have gathered several organisations today: the different Ministry of Economy departments, the investment agency "Invest in Lithuania", and the Ministry of Education and Science. To understand that people from the same institution but different departments do not meet. They just met at our event, which means everyone is still working in their fields. There has been a step forward, but a lot needs to be done to achieve such good coordination.* (22-F-LT)

Concluding from the discussion above, the policy-makers' degree of engagement might depend upon their perception of roles and their factual or perceived organisational capacity.

Considering that policy-makers might adopt an instrumentalist view and perceive participation through its utility for their work, it is trivial that the same is true for other stakeholders, particularly for the business. The most evident here is the resource dependency argument that came across the interviews: the more stakeholders depend upon structural funding, the easier it is to engage them in different S3 related tasks:

> *I cannot say that it was difficult to get business involved, but probably a little harder than scientists. Because for an elementary reason: we organised a round of discussions of this magnitude. There were even seven stages. The business is counting its time because time is money, and it is quite difficult to participate in seven discussions. Still, many business representatives agreed and participated. The associated structures are pretty active. Maybe it somewhat differs between priorities, but they express their opinion and get involved in the discussion because everyone sees the direct interest. Because whether one is on the priority list will determine whether one will be able to get funding and take advantage of some means. The business that has benefited, for whom support for innovation is important, is happy to be involved in these processes.* (33-NG-LT)

As follows from the interviews, there also appears to be some trade-off between dependency on public funding and time resources needed to devote, which becomes apparent in the following quote:

> *There are many barriers. The more complex the process and documents, the harder it is to get involved. Another thing is the practical value. It is important for those who innovate and want to share the risks and costs with the public sector from a business perspective not to fall out and stay overboard alone. They expect someone to take care of it. Entrepreneurs are very involved. Without realising all that logic and getting in the middle of the process, one does not understand what is happening and why. It is just too complicated. In our case, I set aside some time for it, and there was an opportunity. I was there with a funded project and spent some time just on this whole thing. There was no separate funding to pay for people who would delve, understand and analyse, and somehow help balance all those needs. What happens if the business is little involved, as a rule, dominates the academic sector. They are involved because they have no other way,*

meaning it is the main source of funds. The angle rotates then more towards research, and there is less discussion about markets or products or from where the return comes. (34-B-LT)

Apart from accessing funding, there might be other benefits, such as "marketing" of the domain, prestige, or openness to exchange with others and networking opportunities. The sample quote:

It is possible to boast more, that is some marketing. It was possible to apply in the past [for the funding]. *In that sense, until there was a smart specialisation, we applied and got* [the funding]. *Because we learned to write projects and we were known. As I said at the beginning, it is a development of what has been going on all the time. Just another name, new keywords appear.* (30-B-LT)

To balance stakeholder involvement is crucial for the balanced perspective within a priority domain. The following excerpts from the interviews elaborate on the risk of skewing the process towards a particular direction when the balancing perspective gets lost:

It is maybe just such a general context. In my opinion, it had to be business, certainly not the Ministry of Education and Science with some research, but some business and market perspective. It had to lead forward. There was actually a foresight, some forward-looking perspective. The collective mind was here when many experts came together, several dozen experts in one, another, third field. Well, they still know something. Not everyone understood in the same way at first, but then that understanding got somehow unified. Others attended episodically. (34-B-LT)

Thus, the interviewee relates to some "collective mind", which creates a unified understanding, going beyond the experience of individual experts. Hence, a shared understanding emerges as an outcome of the process when different actors share their thoughts and experience. The following quote is even more exemplary of how different institutional logic guides the view of what is an appropriate outcome of the process:

Some people came from the university, academic sector and said that there should be developed models. I say, what next with those models? Well, we're going to do with them something, but what, we don't really know yet. There were all sorts of different discussions and such cultural differences, where some people think from their belfries, how they could see themselves there. However, that process encourages some dialogue. (34-B-LT)

Establishing relationships with other helices might serve as a basis for the functioning coalition. Primarily, it requires building such a coalition for every priority separately. Sometimes, such coalitions might be already in place. An example may serve the photonics industry in Lithuania. The interview excerpts below elaborate on the factors from the industry perspective, which are crucial for achieving cooperation. These might be different for the public sector and academia. However, the common denominator is understanding the needs and the logic of partner helix and providing them something of value or speaking *their language*:

I would say that it is good [cooperation with the public sector]. *There may be much work for us, and we make public our activities. We really make public our activities. When they* [government representatives] *go somewhere abroad, or the guests of honour come, the heads of governments want to say something nice about their own country. The lasers go well. We export maybe into 80 or 90 countries, into serious, developed countries. Speaking about government organisations, when one tells that Lithuanian lasers are in 80 out of the top 100 universities globally, it makes an impression. Our lasers are in CERN, NASA, and those prestigious universities. When it comes to the USA, in the so-called top 100, there are probably*

> *about 45 US universities, and 40 of them have Lithuanian lasers. I do not know that exactly, but the numbers are good because such are our parameters. I will tell such a graceful episode. The Israeli Prime Minister Netanjahu had been to Vilnius maybe two years ago. He was here for a few days, walking around the city, the old town, the former ghetto area. When journalists came and asked him to tell about his impressions, he started talking about Lithuanian lasers. It was much fun for us that a TV shows Netanjahu, caught somewhere in the old town, explaining how good Lithuanian lasers are.* (30-B-LT)

Therefore, from the quote above, it is evident that the photonics sector helps shape the country's identity and build its image abroad, which is important for politicians. In academia's case, it is a high share of employees with the research background who speak the same language as the scientists:

> *Our primary market was scientific institutions. Since practically everyone was out of the scientific institutions, we could talk to scientists and agree because collaboration works well when people are talking on both sides. There is no communication unless one comes from a company that knows how or what to ask a scientist. Because ours are out of science, it is still not bad. We still have over 1,000 employees in this sector, laser companies. There are about 200 employees in scientific institutions engaged in the field of lasers. In those companies, about 10% of employees have a PhD degree. They did the research, and they easily talked to scientists in the field. That communication is going well.* (30-B-LT)

Ability to understand other stakeholders' reality appears to be an essential motivation for their openness towards collaboration. As the quote below demonstrates, when stakeholders lack the necessary background, they might be unable to catch up, understand the issue, and contribute to the shared solution. The theme has already emerged concerning business involvement and motivation to participate in the complex processes discussed earlier in this chapter. The quote below reflects a similar problem concerning broad society, as the fourth helix:

> *At the very beginning, I remember much discussion about attracting society and how to involve it. However, it is not a matter of complicatedness. It is Sisyphus' work because it will not bear much fruit. We joked that you have to be smart yourself to understand smart specialisation. It is mainly dedicated to R&D, and indeed, not everyone understands where it comes from, what the process is, who needs it at the end. There have been many educational talks and articles, and "smart for dummies". We have tried to do infographics to make it clear to everyone, but in reality, it is not for the general public because a baker does not need the smart specialisation in a hundred years. If he is interested, then only in renewing or automating some process. Generally, it is not even necessary if it is not a target group. There is no need to explain it because it costs both time and resources, just pointless work.* (35-BS-LT)

In the quote above and earlier in the chapter emerges the problem relating to information asymmetry and, in the broader sense, the position of different helices at the learning curve. When business or society helices lack the necessary skills and knowledge that would enable them to contribute equally, there are two possibilities for the public sector:

1. To compensate for the evidence gaps with own contribution and decide "over the heads" of particular stakeholders. In that case, the government may become a *central planner*, which would be a mistake in designing S3 (Foray, 2016a);
2. To appreciate that participatory process might also serve to educate the public. This option would be congruent with the *public as student* frame (Eckerd & Heidelberg, 2020).

Although resource- and time-consuming, the second choice appears more suitable as a step towards helix coalition in the long run.

Thus, different institutional logics, lack of trust and colliding worlds might inhibit the search for a shared solution, especially at the implementation stage. Even if these worlds meet under coercive pressures or financial motivation to prepare strategic documents, different sectors' commitment to joint implementation might be deemed lacking. Table 43 summarises the challenges and solutions concerning the power structures in Lithuania.

Table 43 – Summary: power structures in Lithuania

Component	Challenge	Solution (applied or envisioned)
Power structures	- Identification and involvement of all relevant stakeholders, which might be difficult also due to the perceived roles and responsibilities	- Other stakeholders compensate for lacking evidence with their knowledge; - Educating broad groups of stakeholders; *The first solution is risky as it may skew the process towards vested interests, while the second proved challenging to apply. Other possible solutions:* *- Elaborated stakeholder mapping, including government organisations;* *- Working on the self-perception of stakeholders' roles (especially government-related stakeholders);* *- Reducing disadvantages of the fragmented innovation system and improving the organisational capacity of the government helix;*
	- Motivating business and non-government stakeholders to get involved;	- Access to funding; - Non-financial incentives; - Simplifying the process and reducing bureaucratic burdens;
	- To avoid skewing the process towards institutional logics of a specific helix	- Establishing relationships between helices through offering them some benefits from collaboration

Source: own elaboration

5.1.2. Poland

5.1.2.1. Governance structures

5.1.2.1.1. Place-based governance dimensions

Functioning multilevel governance might be advantageous for S3, and different governance levels could be expected to address specific issues. Even though currently smart specialisation in Poland is defined both at the regional and at the national level, it might be beneficial to consider different perspectives concerning the specific analysis level, as elaborated in the quote below:

> *At the country level, we should have a helicopter view. I do not want to call it a national strategy, just a helicopter view. We also need to know what direction we want Poland to go, apart from the regional specificity, where do we have these competencies at the Polish level. If we use them well, they give us a chance to build a competitive advantage. Of course, companies compete with each other, but countries also compete. They better understand their economy, their societies, pros and cons or strengths, weaknesses. Can they build appropriate regulations for it? Or a support system, mainly through regulations. We simply do not consider that everything begins with the understanding that countries also compete with each other and should create the right conditions for all other entities to be competitive. And competitive means also innovative.* (15-BS-PL)

In Poland, each region had run EDP individually and developed its strategy. Such a situation may result in overlapping priorities and multiple sources of funding available to the beneficiaries, as another interviewee elaborated:

> *The main source of financing strategy implementation at the national level is POIR and operational programmes at the regional level. Indeed, Polish regions and national level had to come out of this perspective "my strategy, my programme" to calculate how much money can be obtained from these two levels for their priorities. If some regional and national priority overlaps, it is as if the so-called leverage effect, i.e., some projects can be financed at the regional level, others at the national level.* (1-F-I)

Practically, two-tier specialisation may also be confusing, create inefficiencies and duplicate efforts. It might be especially true if everyone does its own thing, activities are duplicated, and coordination becomes difficult. Such a situation initially could be partly observed in Poland, as indicated in the following interview excerpts:

> *The managing authority at the level of the Ministry of Development should first and foremost take care that these programmes do not compete. At this level of PARP - NCBR, it somehow succeeded. It was much more difficult at the level of Regional Operational Programmes. We tried to establish cooperation, and there were joint ventures with regions, but it is also difficult to explain their purposefulness. The regions also had their funds for R&D projects. We have analysed that these instruments overlap, but entrepreneurs prefer to apply to the NCBR because it is perceived as a more professional institution. The entire application assessment process is carried out better.* (17-NG-PL)

> *We have cannibalism. Because instead of dividing, it means demarcating this support somehow, it is such chaos, and the beneficiaries are confused. Although now probably less, this perspective already lasts several years. However, there was terrible chaos in the beginning. So for me, this causes more confusion than benefits.* (8-RG-PL)

It also follows from the quote above (8-RG-PL) that learning occurs and actors arrange with the new settings. The quote below supports this observation. It also asserts that, even if efficiency might be questionable, firms adapt quickly to the new structure, if it is straightforward, and choose the most beneficial solution. If national and regional level specialisations are similar, it may apply to the differences in terms of project size that can be funded, as in Poland's case:

> *I honestly admit that maybe such a reflection* [confusion among applicants] *arose at the beginning. However, in literally a few months or almost a year, innovative entrepreneurs who must follow the pace of development and take care of their competitiveness in the market caught the idea quickly. There was probably no such voice in our region why it is like this and not otherwise. There are other conditions for application, or, for example, there are subsidised projects of greater value.* (13-RG-PL)

Challenges for multilevel governance might result from the nature of the relationships among relevant actors. In the S3 context, multilevel governance does not imply hierarchical relationships and exercising power from top to bottom, but rather coordination and supporting work from the national level to achieve specific synergies, as illustrates the following quote from an interview:

> *The considerable work to be done is the coordination of information generated in sixteen regional smart specialisation systems. We must see what is happening in the regions. It is difficult because the balance of power is such that we can only ask regions for something. We have no direct influence on what they do. They negotiate their strategies with the EC themselves, so we are trying to create a cooperation network. Because we have more money for the monitoring than regions, we finance some analyses that are, for example, common to all regional smart specialisations or all Marshal Offices are interested in them.* (4-NG-PL)

The quote above also indicates that multilevel governance relies on coordination. Resources are mentioned as a source of potential synergy (money for monitoring). The tension that arises in the context of multilevel governance is between autonomy and common standards, which is implicit in the quotes above (4-NG-PL) and evident in the following quotes:

> *I assess it well* [cooperation with the national level]. *Still, there will always be some friction because local governments want to manage processes at home autonomously and decide what to support in the region and how to do it. However, the* [national] *government side tends to standardise certain things, which is probably the place of the largest frictions.* (8-RG-PL)

The opinion of another interviewee supports the quote above. It refers to the possibility of centralising the funding at the national level:

> *We will not let it happen* [centralisation of funding]. *However, hypothetically, if it happens, then the specialisation itself loses its meaning.* [Smart specialisations] *were supposed to endeavour processes regionally, locally. They were supposed to strengthen the foundations of innovation in regions that later form, like Lego bricks, the entire country's image.* (7-RG-PL)

A significant point in the quote above (7-RG-PL) is also that interviewee perceives autonomy of funding as an essential element of regional S3. Consequently, it implies the possibility of designing a tailor-made mix of support measures and better addressing specific needs at the regional level. Funding availability at the appropriate level appears crucial for implementing initiatives initialised

at that level. Thus, another interviewee refers to the example of the *Vanguard Initiative*, which unites several leading regions committed to collaboration within S3 at the international level. The regions started several pilot projects in different areas, resulting in the development of innovative solutions with the joined forces of interregional partners. As the quote below demonstrates, at some point, formalisation of structures becomes crucial for advancing the goals:

> *These* [areas of pilot projects] *are the domains in which the Vanguard Initiative regions want to cooperate. They also separated such internal groups - and we are still talking about an informal organisation - in which such a lobbying group was established. This group analysed the needs of the pilot projects for financing from the EU. It analysed the gaps and urged the EC to change programmes or introduce a new instrument that would enable such* [support] *as part of pilot projects when necessary. This group tried to press the European Commission to remove these barriers to developing such interregional cooperation. When creating such European technology projects, EU funds often had to be limited to spending at the national level. These regional funds must be spent in a given country and not abroad. It was the fundamental barrier. Things went so far that it turned out that such an organisation in an informal form cannot exist anymore because it has simply become too big and there are too many needs. Therefore, the Vanguard Initiative was registered as a non-profit organisation under Belgian law.* [As a result]*, there is a so-called fifth component as a proposal from the EC in the new funding period. This fifth component is clearly the lobbying effect of the Vanguard Initiative. It is the answer to the needs of this organisation. It shows how strong position the initiative has developed in Brussels, among the European institutions.* (18-RG-PL)

Similarly to the organisations at the international level, such as *Vanguard Initiative*, which aims to advance regions' interests at the international level, in Poland, this function has *Regional Smart Specialisation Forum*. As an interviewee puts it:

> *It is also an instrument of pressure on the* [national] *government. For example, now, for the new programming period, the very harsh stance of the Regional Smart Specialisation Forum has caused the government to soften its position and withdraw from the idea that there is no money for R&D projects at the regional level. There were ideas that there would be money for research only in the new Smart Development Operational Programme. However, it was possible to fight that it would also be possible to support these smart regional specialisations at the regional level. Because if there were no money at the regional level for R&D, there would be no point in making smart specialisation strategies.* (12-RG-PL)

The issues discussed above referred merely to the aspect of multilevel distribution of funding. However, striving for synergies could also be beneficial concerning specific specialisation domains or priorities and help reduce duplication of efforts or fragmentation of specialisation domains across regions. The quote below depicts difficulties experienced in Poland while attempting to synchronise activities at the national and regional levels within similar specialisations:

> *As working groups at the ministry, we do not create and participate* [in creating regional specialisations]*, which is also a drawback. The regions work according to their scheme. This consistency should be maintained. We often addressed it at meetings in the ministry or with the Department of Innovation, which is responsible and directly supervises the activities. We would also like to meet at the regional level, considering the scale of the entire country. If, for example, there are also similar specialisations in other regions of the country dedicated to the same problematic areas, then there would be this possibility of exchanging experiences and synchronising certain things. It would be like creating the value chain. There is a problem with this cooperation between the national and regional levels. However, we as members do not influence it. We report it, but if it will be accepted, that is just another matter.* (21-BS-PL)

However, there are some niches where cooperation works well, such as photovoltaic:

> *Indeed, the synergy effect is nice here. However, this is a niche. Photovoltaic is a niche. It is much more difficult in the more popular ones. These activities, at the national level and the regional level, everything is monitored. However, it is not a matter of tools concerning the possibility of cooperation or willingness to cooperate. It is more about human relationships and wanting, which results only and exclusively from human capabilities. It is more this human factor that blocks. Because we can create tools and a platform, but if there is no will, it will not be possible to implement.* (21-BS-PL)

Aligning administrative capacities might be relevant to organise efficiently across different governance levels or between different stakeholder groups and within a particular level. Aligned administrative capacities might reduce inefficiency in the governance structure and generate synergies. Considerable difficulties in aligning capacities do not necessarily reside within administrations in particular regions. They can result from the structures at the higher level that affect activities at the lower levels. The quote below provides such example concerning S3 and Horizon 2020 Framework for supporting high-quality innovation projects at the European level:

> *From the Brussels perspective, I see a drawback: the threads come from two different Directorates-General of the EC. The research and Innovation Directorate manages R&I and deals with "Horizon Europe" and the Innovation Framework Programmes. Everything related to S3 belongs to the Directorate-General for Regions and Cities. Unfortunately, as it happens in such institutions, internal communication is sometimes lame. It is also better than it was, but one can see that two directorates do it, with two differing principal interests. Unfortunately, this causes a hiccup somewhere later in organisations responsible for implementing both programmes. For example, very intensive work is underway related to new structural funds, new operational programmes at the national level, the so-called "POIR +", and ROPs. There are also discussions about Horizon Europe, which is also on the final straight in preparing the regulations and work programmes. These processes overlap a bit. Not everything that should be agreed upon concerning "Horizon Europe" and sent as a package to simplify the work of Marshal Offices or ministries responsible for the regional issues is ready yet. So organisations, people responsible for programming these operational programmes, have a question mark because they do not know what to enter to avoid closing some possibilities. To have precise guidelines on how to combine it. We have some tension here, but we also observe much interest from offices like Marshal's, which have focused only on RDF or SF so far. Now they ask about "Horizon" and want to programme it, use it and relate it to S3 at the regional level.* (14-BS-PL)

As becomes evident from the quote below, S3 is a complex approach that might need broad involvement of different stakeholders, including engagement of different public authorities that possibly appear not to have anything in common with entrepreneurship or business:

> *We also pointed out that there is* [a need for] *inter-ministerial cooperation, which is also important. Unfortunately, it is also difficult because each ministry has its interests. A good example is when we asked that we would like the Ministry of Science and Higher Education representatives to appear at our meetings since we are talking about smart specialisations, and unfortunately* [they did] *not. Either there was a refusal, or there was no time. Those who supervised us told us they had invited them, but unfortunately, there was no will and willingness to cooperate.* (21-BS-PL)

However, interviewees account for positive development in aligning administrative capacities and dialogue between relevant organisations in Poland, e.g., during joint involvement in the S3, ensuring flexibility for the decisions or using the experience of relevant agencies. The interviewee

in the sample quote below is optimistic about developments in the cooperation between different government organisations, despite being aware that the system is not stable yet.

> *Many agencies were involved. There were three separate ministries, the Ministry of Science, the Ministry of Development, and the Ministry of Economy, then the agencies, the NCBR and PARP, and, of course, all those other administrative institutions. I think a curve is going up. The cooperation grows, although we will also see what it will look like, because sometimes, the entire system changes, new institutions arise, and some fall out. So it is a long way to design a stable system. It is constantly changing. However, I think this cooperation is getting better, developing more and more.* (3-NG-PL)

Another interviewee reports on ensuring flexibility:

> *Finally, we presented the smart specialisation strategy. It went through the Council of Ministers along with the enterprise development programme. A provision said it would only go through the Council of Ministers once, and the Steering Committee would make all other changes. In this way, we provided ourselves with the flexibility of the process and the ability to respond to rapidly changing environments and entrepreneurs' needs.* (4-NG-PL)

The interview excerpt below elaborates how the capacity of extant organisations might be used to support EDP:

> *PARP is one of the first such executive agencies. It also supported the ministries with analyses or research and co-created this project. The ministry already did some things rapidly because it was responsible for it. PARP joined because the ministry asked due to experience in carrying out evaluations. After all, PARP is one of the first institutions that did evaluations, and it has much experience. Additionally, it has experience in cooperation with entrepreneurs. Entrepreneurs know PARP as an agency that operates and has a large offer for entrepreneurs, including subsidies. These are also elements that encourage entrepreneurs to come to the meeting. They submitted applications to PARP, want to submit them, or know the research. PARP has been one of the largest agencies operating for a long time, so it is also possible to discover and improve the procedures. Some people work for a long time in PARP and thanks to that they remember what did not work and how some things can be improved, so I think it is very valuable. We learn from our mistakes. PARP is already many years old and makes fewer of these mistakes.* (5-NG-PL)

The interviewee in the quote above often mentions the following keywords: *experience*, *long time*, *and learning.* These relate to essential factors for EDP to succeed, which PARP can offer: collection and evaluation of evidence, cooperation with business, ensuring involvement of firms in EDP. Hence, capacities for EDP have been built over time in the continuous learning process. The finding is in line with observations in other studies on the development of governance arrangements (see, e.g., Höglund & Linton, 2018; Karo & Kattel, 2015; Kriz, Bankins & Molloy, 2018; Rehfeld & Terstriep, 2019).

5.1.2.1.2. Sectoral dimension in the governance structure

Interviewees in Poland mentioned challenges related to deficiencies of the sectoral governance component. The solutions that policy-makers consider include the appointment of facilitators or leaders for specific specialisation domains. However, the approach to S3, relying upon facilitation and leadership, appears to be already practised in Poland. It bases upon an element of S3 that has

been promoted in the World Bank pilot project and implemented by PARP in two stages, *smart panel* and *smart labs*, which are referred to as a research process. The smart panel aims to set specific topics that are further elaborated and developed in the smart labs, as the quote below elaborates:

> *The research process aims to find areas with innovative potential. There are three cycles with a particular method for conducting this research. What comes out on the smart panel, i.e., such an area, topic, is then implemented in the smart lab. We invite companies to meet. For example, we will meet companies with innovative fertilisers. We have such a structured work process with these entrepreneurs. As a result, an in-depth analysis of the topic develops where there is an area that companies want to cooperate.* [There may be] *ideas for projects or project areas that entrepreneurs could implement. They declare whether they are interested in it and put their zloty, but they want the state to add another.* (5-NG-PL)

Facilitation and management appear to be inevitable conditions that may advance specialisations also at the regional level. Three examples from different regions are discussed below to illuminate the issues faced in this aspect. The following quote reflects the discontinuity in the process of S3, which occurred after priorities had been defined:

> *We do not have a history like other regions. We also researched, e.g., regions from Ireland, Spain, Great Britain. What we were doing, they were doing 20 or 15 years earlier. They had a history of cooperation locally, regionally. They could prepare themselves for it. We did not have this history, and overnight, let us say, we chose these specialisations. It was one and a half years of intensive work, several meetings a day with various companies and research institutions' representatives. It was just like a mill. Suddenly, after this year and a half, these specialisations were selected. In each specialisation, councils were created, members were elected, ten people were to continue managing this specialisation, setting directions for action, communicating with us, etc. However, suddenly, the process stagnated. Why? Because people did not have a sense of benefits resulting from this cooperation and the* [lacking] *skills to cooperate in such structures. They did not know what to do with themselves. They were seated at the table and admitted themselves: we do not know what to do, we do not know how to do, we do not.* (7-RG-PL)

As becomes apparent in the quote above, sectoral governance within specialisation lacked due to the weak stakeholders' capacity. Therefore, policy-makers had to compensate for that. Naturally, policy-makers are unlikely to have the necessary capacity (including competencies, knowledge, position in the business-specific networks) to organise and coordinate networks and the search processes around priority domains. As the quote below reflects, the solution was to appoint specialisation leaders.

> *We got funding for such a project. We will announce a tender for leaders for each specialisation. We want to spend this money on their management, under the leadership of a specialisation leader, who will also help to use this money wisely for the needs of companies and organisations in this specialisation.* (7-RG-PL)

The more immediate solution to facilitate specialisations' development has been obtaining help from a consulting company. The quote below elaborates on the help a consulting company could provide on the example of health specialisation:

> *Health is a very broad area. There was no cluster in this area, a leading entity that could be a flywheel for these activities. First, they* [consulting company] *did an overview of all the institutions in the region that have anything to do with health, with diseases. They made such a list of all organisations. Plus, they proposed that base because they went into the qualitative interviews, panels, Delphi research, etc. They contacted these organisations and asked them directly about their needs and how they would see further cooperation. There were opinions, among others, that it would be necessary to collect financing opportunities available to the medical industry, such an industry that is about to develop towards* [name of a specific domain]. *They did it too. They also arranged various business environment institutions, looking at what they do in this area of health. So they made such a map. A map that is so cool that when one uses it in a car, i.e., goes on a trip, if he does not know the area, it will show what institution is doing, what it is interested in, etc. Many ideas come. One can build something on this basis.* (7-RG-PL)

From the quote above, it becomes evident that organising and coordinating work must be more intense if specialisation domains are not backed up by a solid coupling structures in the business sectors. Apart from leadership, specialisations might also need practical support:

> *Each of the specialisations had its tutor, i.e., a dedicated person. If it was energy, then a person knew about the energy. For example, what else did* [the consulting company] *do? Such pragmatic, practical things. Often these specialisations prepared various projects that involved many partners and were not quite able to organise these into a project.* [The consulting company] *just prepared such a project analysis in this energy specialisation and submitted such a project to put it together, proposing roles to individual partners. They prepared a project, ready to be submitted for funding.* (7-RG-PL)

Such practical support might be especially relevant for the "less experienced" priority domains or immature innovators that just detect innovation potential for their business.

Another example for the leadership issues in particular specialisations serves a different region. In this case, policy-makers established working groups to conduct tasks within specific priorities, as the quote below points out:

> *Once we took specialisations, we had to manage them. Tracking whether something is changing within these specialisations, whether the accents are changing, or maybe some specialisations emerge as the primary, key, technological trends. It all had to be watched. Well, our idea was to establish working groups for each specialisation. To empower ourselves with research and analysis and with such living knowledge available directly from the environment and support this decision-making process in terms of changes, shifts in the context of specialisations.* (10-RG-PL)

Notably, the interviewee mentions the need to "manage" specialisations, but the activities mentioned in the quote above refer predominately to monitoring and evidence-gathering. From the quote below, it becomes even more apparent how worthwhile policy-makers perceive collecting nearly complete evidence and having a roundabout view for not missing any relevant developments:

> *We did one more thing, but then life verified it a bit. We established an interdisciplinary group. One extra group had to observe trends with potential, which are not included in smart specialisations but could negatively affect the economy if overlooked. However, we do not have such a result yet. The question is, why? Is it because there is no such technological area or specialisations are written so broadly that it is difficult to propose something new? I do not know the answer to this question.* (10-RG-PL)

The following quotes illuminate further development of roles pursued by working groups. The quote below reveals how the activity and engagement change with changing tasks:

> *There are groups. Although the activity area is modest, they still meet because when there was a need to define and specify smart specialisations, the working groups passed the exam very well and did their job. When there was no need and no discussion about a new process, a new definition of specialisation, these working groups seemed to have quieted down a bit naturally. On our side, we are constantly trying to supply them with up-to-date knowledge.* (10-RG-PL)

Therefore, the working groups initially had a clear goal: defining priorities and agreeing on common interests. When it has been accomplished, the task became less specific: to watch what is going on and whether there is something new emerging in the field. Thus, activity is more analytic and less concerned with strategic decisions or implementation. The quote below demonstrates that to ensure implementation and continuity of EDP, it might be beneficial to base upon existing structures:

> *It would be an excellent working group effect if such a leader were in a given working group. We have such a case in the Life Science group, where the Life Science cluster is the group leader. Indeed, the cluster vigorously animates and guards technological development in the specialisation even beyond the process. It is an excellent example, but it is not the case in other working groups. Hence, our internal discussion, for now, is whether the future process should be based on existing entities, such as clusters, associations, or transfer centres. They are doing the work we need them to do, and creating new beings does not always work.* (10-RG-PL)

Thus, the implication for EDP from the quote above would be starting analysis with mapping of core actors and infrastructures and links between them, instead of focusing primarily on extant industries or technologies and combining them into categories, e.g., green economy or IT. Latter grouping might bear the risk that technologies or industries grouped into one category have no shared knowledge base to enable EDP and relate to each other only through the goal (e.g., exploiting renewable energy sources).

A more advanced example of ensuring leadership in the Polish context provides the third case. The region adopted an approach to the advancement of innovation and S3, which bases upon specialised entities. These fulfil different tasks, as the quote below elaborates:

> *We have established a network of [entities] created in all technological and smart development areas. It is a management tool in the voivodeship, this network of* [entities]*, to programme, implement, and monitor smart specialisations and conduct EDP. The Sejmik resolution adopted in 2018 and developing regional innovation strategies shows that this results from EDP. The leader of each* [entity] *is such a natural centre of competencies. Often in these particular areas, the function of this natural centre of competencies may be fulfilled by a scientific unit and business support institutions.* (9-RG-PL)

As stated in the quote above, leaders of entities might be business support institutions or HEIs. Indeed, the analysis of the official documentation and the regional website dedicated to S3 supports

this information: HEIs or RTOs are engaged as leaders or partners of leading consortia in most areas. The document analysis also shows that the entities have been established as analytic bodies, supporting monitoring and evidence-gathering for specific technology fields. Later, their activity has also been expanded to conducting EDP. By introducing S3, the region could build upon the former experience of innovation strategies development and extant partners, as the following quote asserts:

> *Our innovation strategies are not created and have never been created due to a tender. It has always resulted from a very long, painstaking grass-roots work, and the innovation strategy that we are aiming for 2020+ will also come about this way. We are perfectly connected in this region, and we cooperate regularly. We have these natural competence centres in the form of a network of* [entities]. *We have all those active managerial bodies, i.e. the Steering Committee, the [name of the region] Innovation Council. All of this together creates a specific regional innovation ecosystem. As with updating the [document name], every strategy or strategic document created is being developed with the broad participation of all competent institutions in the region. We do not have problems with consultations because all the important strategic institutions prepare our strategic documents.* (9-RG-PL)

The quote above mentions three antecedents for successful stakeholder involvement in the strategy development process: long-time grass-roots work, connectivity, and existing governance structure (*entities* and other relevant bodies).

Considering the balance of influence between different stakeholders, challenges concern business structures and representation, and the issue of leading role among different actors, as illustrated in the below excerpts from interviews:

> *Every enterprise has to join a trade union in Germany, but Poland has no such obligation. There are representative entities, but the question is, to what extent do they represent each member? With tens of thousands of small enterprises, indeed, no one will be able to talk directly to them, so some environments represent them. Small and medium-sized business representatives should be included in this group as members of particular working groups, discuss and present these small and medium-sized enterprises' prospects because large entities may dominate working groups.* (1-F-I)

> *This document has also been consulted with various business-industrial circles. However, there is a question of the emphasis: when do entrepreneurs play the leading role, and when do not. It is a purely subjective issue, and here it is impossible to introduce any unequivocal border.* (2-BS-PL)

As elaborated by another interviewee in the quote below, policy-makers relied on the contacts available to government organisations, already known from previous policy initiatives, such as clusters. The quote also supports the insights that those who already have cooperation and participation experience are better equipped for the dialogue and able to deliver better results at the end of the exercise:

> *It was not easy to find people who wanted to talk about technology development trends. On the one hand, we relied on the contacts we have because we have an entire department of industrial policy, which deals with and takes care of individual sectors and leading companies. However, the most important thing was the work with PARP, which granted funding for innovative projects and had an entire base of entities suspected of being innovative or interested in innovation. The regional authorities also expected to be*

consulted on every action carried out in the region. They also helped us select entrepreneurs for the interviews and meetings. Finally, our work in cluster policy and experience of organising meetings about cooperation with clusters from industry also helped, so this concentration of discussions about specific technologies had a chance to occur. It was the best idea. They were also our most aware interlocutors, and we had the best results from such meetings. (4-NG-PL)

Table 44 summarises the governance structures in Poland.

Table 44 – Summary: governance structures in Poland

Component	Challenge	Solution (applied or envisioned)
Place-based governance structure: Establishing multilevel governance and aligning administrative capacities	- Duplication of priorities and financing sources across levels might cause competition between programmes;	- Beneficiaries can arrange with the system, but initially, inefficiencies may persist (e.g., when priorities or support measures overlap, but from beneficiaries' perspective it is not clear which option is better for the own project, a decision may be based on the assumed competence of a support-administering institution);
	- Balancing responsiveness and synergy (centralisation-autonomy tension);	- Centralised resources for shared interests (e.g., collecting certain data necessary for monitoring); - Autonomy to ensure responsiveness also at the strategy implementation level (e.g., deciding upon implementation measures and distribution of funds); - Coordination work across levels (e.g., narrower priorities at the regional level, broader view of the national S3, addressing the potential of several regions); - Coordination to avoid duplication and gain synergy works better for the "niche" specialisations.
	- Administrative structures at the higher level and lacking engagement of particular actors from the public sector affect S3 processes;	- Growing cooperation and coordination at the administrative level (horizontal and vertical); - Connecting processes to the higher-level structures and elaborated stakeholders' mapping; *Little attempts to address the challenge could be recognised. Thus, a political initiative from the stakeholders and grassroots work may be necessary.*
	- Improving organisational capabilities	- Ensuring flexibility through specific arrangements (e.g., by signing agreements between government actors to simplify bureaucratic processes); - Using the experience of extant organisations;
Setting **sectoral governance structure** and balancing influence	Lack of relational structures within domains hinders development: - Stakeholders cannot develop the domain on their own, despite bottom-up prioritisation process; - Stakeholders pursue analytic activity within the domain but are not concerned with implementation;	- Appointing "leaders" for every specialisation, who would be responsible for the domain; - Mapping domain structures; - Ecosystem-based approach; - Organising domains around extant industry-based structures (e.g., clusters);
	- EDP quality might suffer from inadequate business involvement (too little involved, too superficial discussions due to poor strategising capabilities)	- Relying upon established ties with business; *How to involve a broader range of stakeholders remains unsolved, especially those beyond the associated structures. The dominating view was that it is not possible to involve everyone.*

Source: own elaboration

5.1.2.3. Relational structures and institutional arrangements

S3 has been deemed a new tool in the European approach to innovation policy-making (e.g., dubbed a "policy experiment" by Foray, 2018b), implying unprecedented change. However, interviewees in Poland often perceive it as a continuation of previous policy development, evolving from what has already been there. Consequently, it affects the S3 approach, including how the relational structures develop and responsibility is being shared.

The extensive elaboration provided by an interviewee is helpful to understand better the approaches to S3 in Poland. This perception of innovation policy history is also implicit among many policy-makers. It manifests itself as an extension and further development of previous approaches and connections between S3 and earlier adopted documents. Hence, signs for some continuity come across several quotes in this thesis, provided in different thematic contexts. The following three passages from the interview summarise the policy-making tradition in Poland as evolutionary:

> *One can trace such an evolution that initially, EC used to be wholly voluntary but promoted the creation of "Regional Technology Transfer Strategies" in the regions. It was called so, I think. The first such documents are approximately from the turn of the 90s and the new century. Then there were the Regional Innovation Strategies, famous RISs. After another, let us call it a political turnover, and after the next financial perspective, there was no longer talk of RIS, only regional, the so-called S3. For me, they were a natural consequence and a natural way of developing the EC's approach to managing innovation at the regional and national levels.* (16-BS-PL)

Moreover, the interviewee elaborates that the basis for EDP has already been formulated in the previous approaches and refers to a "new sticker" for the same approach, which is in line with the observation in fashion theory and research on sedimentation (see Heusinkveld & Benders, 2012):

> *On the one hand, we are talking about the document itself and the very concept of these smart specialisations. On the other hand, we have a process supposed to lead there, which did not appear from anywhere. This name was new, and some expectations may have been reformulated. However, as a rule, both at the stage of creating these technology transfer strategies and then at the stage of creating RISs, [there were] participatory mechanisms, stakeholders' involvement. So we have a new process sticker again, a new process name. However, the mechanisms underneath are obviously not brand new.* (16-BS-PL)

Therefore, probably the most profound change in the EC's approach, from this perspective, is making S3 mandatory. Coercive influence required member states to prepare S3 and do it according to certain principles. While perceiving S3 as a continuation of previous approaches, the interviewee also mentions a fundamental element introduced with S3 and EDP in Poland: a transition from a consultative to participative model in creating strategic documents. As explained in the following quote:

> *Entrepreneurs did not understand it for a long time or did not have such a feeling. Historically, there was no such strong public and social involvement in preparing this type of documents in Poland. In Poland,*

> *such a model, let us call it consultation, was dominant. A relatively passive consultation model, in which public administration developed documents - be it at the regional or central level, after that, already at a reasonably advanced level of readiness, they were transferred to the public consultation. It concerned both legal acts and strategic documents, conceptual. This model still functions formally today and has its advantages and disadvantages. The question is, can it be done differently or better? I do not evaluate it. This model works to this day, only it was a significant shift, that from this consultative model, it was necessary to move into a participatory model*. (16-BS-PL)

Thus, in line with the observations elaborated in the three quotes above, the direction of search in Poland at the national level determined two foresight projects run before S3, as heightened in the following quote:

> *The process of defining smart specialisation in Poland actually started several years ago. It started with two activities, led by two out of three ministries involved in the S3. The first activity was an activity carried out by the Ministry of Science. The Ministry of Science was preparing the so-called National Research Programme. It was a programme that defined seven main research areas crucial for Poland, as far as I remember. They use our potential and are also key research. At the same time, the Ministry of Economy conducted an extensive analysis among entrepreneurs and scientists, and various institutions from the science and business environment, technological foresight. This analysis also showed, albeit in a completely different perspective, more specifically, a list of key technologies in Poland, which can push Poland's industry onto some better tracks, accelerate and increase its competitiveness. There were many of these areas, about 100, as far as I remember. They were very detailed. There were certain technologies, so these were particular areas.* (3-NG-PL)

As follows from the quote below, combining results from these different foresight projects into a congruent direction was a challenging task:

> *Of course, the process was complicated because every scientist or every entrepreneur thought his topic was the most important. So we have navigated in this sphere of pressure and lobbying. In all this, the colleagues from* [name of a ministry] *helped little. For this discussion about S3, they provided a document called* [name of a document]*, which was very broad and horizontal. At this point, we took another document to help narrow this intervention, and it turned out that it even extended it.* (4-NG-PL)

However, evidence shows that EDP might be channelled not only on thematic issues but also on a suitable geographical level. While in Poland, there is a national and regional level of S3, there have also been considerations to organise EDP even more locally, as the example of one region illustrates:

> *At the first meeting, various issues were raised, whether we should have one specialisation for the entire voivodeship, or considering its size, we should, e.g., have county specialisations. How to approach having* [name of a city] *in general? We gave up on specifying specialisations in some subregions. We decided that specialisation should cover the entire voivodeship to use* [name of a city] *research potential in areas that are not economically characteristic of* [name of a city]. *Well,* [name of a city] *and the surrounding area.* (6-RG-PL)

The following quote makes it even more clear that in the context of S3 and cooperation between different actors, the issue of territorial specialisation boundaries might arise:

> *The adjustment of regional science and business environment to the needs of regional entrepreneurs is indeed a problem. In the spirit of S3, I explained the following to entrepreneurs at various meetings - and the regional authorities also realised this. In* [name of a region] *voivodeship, we probably have the sub-region with the highest concentration of the dairy industry in all of Europe. Hence the potential is visible*

> *on the map of Europe. However, the first university that deals with food and dairy matters is* [located] *in* [name of a city]*, a different region. We quickly saw that our regional and scientific potential did not quite match what the economy had been doing for many years. We saw it, but it has become a problem for S3. S3 is such a chance to talk about our science, education, and business environment, R&D centres and technology parks in the context of entrepreneurs' actual needs. Because if an entrepreneur from* [name of a city] *sees that his university does not give him scientific support and wants to arrange money for S3, he will not think long. We will not be able to appeal to his regional patriotism to leave money in the region. We quickly realised that even if we have our ROP and want to spend this money on business-science cooperation, unfortunately, we lack the science well-prepared to spend this money. The money will flow out of our region. They will deliver for our entrepreneurs, but partly the beneficiaries of these funds will be external organisations.* (19-F-PL)

The quote above outlines that regional boundaries do not necessarily match the boundaries of the sectoral or technological innovation systems, which may have implications for S3 if EDP focuses solely on regional actors and fails to account for the outward dimension. In the second half of the quote, the interviewee reflects on funding and regional development implications. In this context, it may be beneficial to consider conducting EDP at different levels, with respective funding availability at the specified levels.

Table 45 summarises challenges and solutions concerning relational structures in Poland.

Table 45 – Summary: relational structures in Poland

Component	Challenge	Solution (applied or envisioned)
Relational structures	- Changing from consultative to the participative model;	- Attempting continuity, incorporating extant work into S3 and building S3 on the previous approaches as far as deemed appropriate;
	- Combining information from the multiple sources into a congruent direction (results from the foresight projects at the national level; regions had variable approaches); *- As follows from the foresight reports, the challenge is also ensuring better representation of business perspective in the foresight projects;*	- Descriptions follow a scheme: field-priority-technologies; *- Since the national level foresight was perceived as the most comprehensive survey of firms in Poland, policy-makers recognised no drawbacks;*
	- Only part of the potentially relevant stakeholders resides within regional boundaries.	- Exploiting the potential of multilevel governance, e.g., through creating priorities that involve several regions to support these natural structures (not fully exploited yet, the closest approach is national the level S3, with the priorities that involve capacities from different regions).

Source: own elaboration

5.1.2.4. Power structures and field logics

The attitude towards own role may determine the engagement of the policy-makers in the process. It also delineates the relevant tasks and scope of the responsibility for the outcomes. The definition of EDP presented in the introductory chapter portrays the roles and responsibilities: stakeholders discover opportunities and policy-makers "assess outcomes and ways to facilitate the realisation of this potential" (European Commission, n.d.-g, para. 1). Indeed, such a constellation could work when stakeholders organise themselves in a bottom-up process, and policy-makers discover such emerging initiatives. An initiative that emerged beyond the working groups of S3 in Poland provides an example. The following quote concerns the possibility of including the initiative into one of the priority areas as a task team. The quote reflects the self-perception of the policy-maker as a facilitator of such emerging bottom-up initiatives.

> *In this entrepreneurial discovery process, we will probably include these groups, or such teams, topics that appeared somewhere at the grassroots without our interference. That is, they did not arise in subgroups of smart specialisations. Of course, there are people with the goal of a mentor. It will become an open team, and they will not have the possibility of not accepting someone, or not listening or not considering someone's opinion. However, they will have some organisational support, we will be able to offer, which they need. So what appears somewhere without our intervention and concerns broader projects, R&D priorities or partnerships, but not just idle concepts - we are trying to, I do not want to say "take over" but only take into account. That is it.* (6-RG-PL)

The leadership or mentorship within these initiatives is already present because the stakeholders manage to self-organise. Here, policy-makers do not have to act as animators and can take a facilitating role. Policy-makers are aware of the region's developments beyond S3 and seek to be open, inclusive, and supportive of the emerging initiatives.

The pattern depicting how the perception of own role and organisational capacity determine the engagement of the policy-makers becomes even more evident when looking at different examples from Polish regions, presented below. The following quote describes varying approaches of regional policy-makers to organising EDP, dealing with what has been done by own means and where external support was involved:

> [Name of a region] *will be led rather by its strength, although it has recently cooperated with* [consulting companies]. *In* [name of a region]*, considered a good EDP implementation example, the task was entrusted to a team from the* [name of a HEI]. *In the case of* [name of a region]*, a strategic advisor was involved, who, for example, organised groups, first discussions, and prepared some analyses. In the case of* [name of a region]*, the Marshal's Office generally conducted the process but with the support of contractors who provided analyses and expert opinions. In the case of* [name of a region]*, the first version of the strategy was entrusted to a consulting company. In the case of* [name of a region]*, it can be seen that consultants were employed to describe these specialisations and in-depth analyses. In the case of* [name of a region]*, leading consulting companies were employed for strategy and roadmaps for specialisation. So, the authorities at the regional level did not feel strong enough to draft very intricate documents.* (1-F-I)

The quotes below illustrate the engagement of the regional policy-makers and reveal the reasons behind seeking support.

> *We were the region that did everything by itself. The disadvantages of this are that sometimes it lacks a critical sideline. However, we had reviewers: the EC, the Ministry of Economy and all 15 regions associated with us in the Regional Forum. We showed the public what and how we do, so there was a settlement. Plus, we were a pilot region in the World Bank project. There was a project by the Ministry of Economy and the World Bank. Four regions were selected, and we were one of them, and this pilot was done with us. However, it was our original concept from beginning to end, and we conducted this process from beginning to end. The advantage of this way of proceeding is that the faces responsible for the process are identified, and no one doubts who is responsible for S3 in the voivodeship. It is not any consulting company, but the Economic Department, one director, managers, and employees. Each group has its tutor, an employee, to whom one can write if one has questions or doubts, and such a system works. Although we write the new strategy in cooperation with an external company, it deals with editing the content and not leading the process. We conduct the process and will continue it because such a system works. I have a business card for the entrepreneur. I know whom to turn to when I want to organise, e.g., a thematic meeting. From my point of view, relying on a consulting company causes a blur of responsibility and authorship of this document in general.* (11-RG-PL)

In the quote above, the interviewee recognises some drawbacks of doing everything by themself but still perceives advantages as predominating. The support coming from peer reviews and editing the content is deemed sufficient input from the outside. Clear lines of responsibility, combined with the ownership of the strategy (also expressed as authorship of the document), are in the foreground.

Other regions sought advice to evaluate potential specialisations after stakeholders submitted their proposals. The interviewee elaborates on what basis advising experts have been selected:

> *Well, this is indeed a very sensitive point. Very, very important, because we did a little differently than other regions, whatever a good idea one had. I mean, it would not be logical for us if we were to drive this process and evaluate or verify it later ourselves, right? We concluded it was not. To verify these ideas, we wanted to engage the wisest heads from all over the world.* [We wanted] *to attract people with Polish roots scattered worldwide. Among others, thanks to the involvement of other institutions, including* [names an academic organisation]*, we managed to attract very famous people so that they could assess the reality of those ideas that individual smart specialisation partnerships have submitted. We even had people like* [names several prominent experts and their organisations]. *With the business experience that we especially wanted, they were not just scientists but also people who had this baggage of experience as part of commercialisation or understood the specificity of what smart specialisations are for the region.* (7-RG-PL)

Hence, the reasons for seeking advice that become evident in the quote above are foremost neutrality and legitimacy. Combined with the experts' local commitment (nationality and roots), international expertise may provide them. In the following quote, the interviewee also reflects upon engaging consulting companies and experts and provides the reasons for doing so:

> *There were different companies at different stages. The local government will not* [be able to] *do some things by itself, such as surveying a large group of entrepreneurs. Suppose we want to have a large sample. In that case, we cannot have the resources, nor do we even have such a need because specialised companies conduct research there, whether CATI or CAWI. We also hired experts who could look from the outside in a broader context at the processes. There were consulting companies. Apart from the*

> *research, qualitative and quantitative, we also expected some expert comments and recommendations based on these studies' results. We also had experts who helped translate our work results when developing the strategy itself. Thus, how to edit this strategy based on what has been developed in the voivodeship. Usually, these are people who have many years of experience. Often they know the region. Who helped us develop the final version of the strategy? These are people from the [name of an HEI]. They are also professors who have such a broad view of the situation, compared to other regions of the country or Europe. They are also specialists. That is, we are always involved in the process. Sometimes we ask different moderators to help us. We recently engaged the JRC from the EC to help us organise the conference and EDP. What we do now, however, we do ourselves. We do ourselves the opening up to new specialisations.* (8-RG-PL)

The quote provides several notions of the limited capacity to conduct specific tasks by own means: e.g., lacking resources to survey many entrepreneurs. The interviewee often mentions "help" with different tasks: translating the work results into strategy, moderating the discussion, or organising a conference. Important that these people need to be experts and know the region. Thus, renowned expertise and familiarity with the regional context are essential, as in the previous region (elaborated by 7-RG-PL).

Another important clue in the quote above is that complex process design might exclude those who are not keen to devote much time to learning the procedures. One more issue is a different time frame that stakeholders usually consider. As follows from the quote below, business tends towards short-term goals:

> *I interviewed companies from* [name of a region] *regarding their profile and the possibility of submitting some postulates for S3. It is that when one talks to scientists, they do. They talk about their plans and ideas, and so on. For them, the prospect of developing a topic, a three-year, five-year perspective, is absolutely OK. However, it is entirely different when one talks to enterprises because they ask what will happen tomorrow. Even as we sometimes say, it may translate into some action in a year, which is kind of general in this process, which means that it will be fast, but it is not fast for them.* (14-BS-PL)

In Poland, non-financial benefits, such as exchange of experience and the possibility to influence the country's innovation policy, were also significant motivating factors for the working group members to engage in the S3 process:

> *Being a member is also a matter of contacts with other entities and exchanging experiences, apart from some prestige. We meet in these groups, but we also exchange our own experiences with the presidents in this consultative group. That is also such an added value because sometimes we inspire each other to various activities or initiatives that would be worth considering, notwithstanding whether they come into force later. The ministry also treats us as an advisory body in creating this country's innovation policy.* (21-BS-PL)

As follows from the quote below, securing the engagement of entrepreneurs is easier when immediate benefits to them are made apparent:

> *When we invite entrepreneurs to meet us, we wonder what we will give them because they count their time and money. So if it is a meeting only to talk over coffee, meet each other, and hear something interesting, then it is maybe too little. However, we started to invite entrepreneurs with the message that for the first time, when we think about the instruments for implementing innovation policy in the spirit of*

> *RIS3, we have such a situation that we do not yet have an ROP. Because work on the ROP is ongoing, we know that we have to meet the ex-ante criterion, and we tell entrepreneurs the following: "Today we can talk about the conditions that will be included in the ROP so that you get money." We did extensive research on the subject of three specialisations in the* [name of a region] *voivodeship. In this spirit, if there was an invitation to entrepreneurs, they responded rather positively. We had many entrepreneurs in the room. The discussion was open and aimed at making the voice of entrepreneurs sound and be considered. These were our recommendations to prepare instruments according to the expectations of entrepreneurs, not the administration's imagination.* (19-F-PL)

An important antecedent for the cooperation appears to be trust, and lack of trust was often mentioned as an obstacle, especially by interviewees in Poland, which elaborates the quote below:

> *A culture of trust. We do not trust ourselves. There is simply no trust at the interpersonal level, between companies, and between companies and administration in Poland. These are the consequences. That is why it was hard for it to succeed. One could prepare a paper, document, strategies. It was possible to involve the science sector in that, as in the case of foresight. Nevertheless, what the paper was created for if later it was not implemented?* (15-BS-PL)

Thus, the quote above indicates lacking feedback towards stakeholders in the type of exercises as foresight (also relevant for S3). Stakeholders serve primarily as a source of information and ensure the legitimacy of the policy decisions. Other foresight functions (e.g., jointly defining the policy or supporting policy implementation by creating networks of stakeholders (European Foresight Platform, n.d.)[8]) are less prominent or neglected. Therefore, stakeholders perceive that further actions are lacking, and their contribution has little influence on policy implementation, which may impede building trust.

Apart from the trust, motivation to cooperate might be set by the respective field's goals and what kind of behaviour they promote and reward, as an example of the academic sector illustrates:

> *As a science representative, I can say that we are changing. Polytechnics are changing faster than universities in concerning cooperation with business. However, systemically, it is still on the top. If someone expects me to cooperate with the business, we would like to cultivate this cooperation outside. Suppose someone expects it, and at the same time, in my employee evaluation sheet, probably 90% of my grade are articles and students I teach, and 10% is my outdoor activity. In that case, one knows that this activity simply rests.* (19-F-PL)

In a broader sense, additionally to the lacking or even negative incentives mentioned in the quote above, the system might create administrative barriers, which impede cooperation:

> *It has been a problem for ages. In the Operational Programme, we have a competitive call for universities to develop research and development units. This competition is probably the weakest because there are many administrative obstacles, such as fitting the Territorial Contract or contract's compliance. Nevertheless, the region has some tools. However, universities should follow what is happening in the economy because it is a coupled process. At the university, solutions are created, enterprises use them,*

8 It is beyond the scope of this thesis to elaborate extensively on what is foresight, including its purpose and functions. Therefore, an interested reader may turn to the extensive literature on this topic and the information provided by the OECD (https://www.oecd.org/strategic-foresight/) and the European Foresight Platform (http://www.foresight-platform.eu/).

> *improve them, and create another innovation. Thus, these two environments drive each other. If it all works together, this is good for entrepreneurs and scientists.* (10-RG-PL)

Thus, the two excerpts from the interviews presented above make apparent that, generally, science is motivated to cooperate with the business. However, cooperation is discouraged by the existing system and institutional arrangements. Hence, policy-makers might take some actions to improve the state-of-the-art and fuel cooperation between stakeholders in the region. An example of how policy-makers may trigger the development of business-academia ties provides the following quote:

> *Now we are implementing an initiative. We came up with the idea that, since entrepreneurs have such a mental, emotional and distant barrier concerning scientists in* [name of a city]*, we gather entrepreneurs from a specific industry from each region and arrange meetings with them. So all the selected entrepreneurs in construction, including energy efficiency and eco-solutions in the field of construction, had at their disposal, perhaps, five scientists. It is different, sometimes three, sometimes six. For an hour and a half, they could exchange business cards, talk and exchange knowledge. The idea was to provide entrepreneurs with contacts at universities. However, it just turned out that it also goes the other way, that these scientists also praised these contacts very much. Because many research areas opened up for further work, I guess that is what it is about*. (10-RG-PL)

In Poland, there is also an example of a region when government, academia and business work well together, as the quote below illustrates:

> *Our Polish flagship example of good cooperation in the triple helix triangle is the* [name of the region] *voivodeship. Here we have a cluster,* [name of the cluster]*, which lives in symbiosis with individuals, regional authorities, and educational institutions that educate for companies' needs in this valley. There seems to be public support because it is paying off, and that is for sure, a good example. The greater the experience and better the cooperation results in the triangle between public authorities, research and education units, and entrepreneurs in the past, the better was S3 process. Suppose entrepreneurs are dispersed and conflicted because they operate in the same industries and fight for every customer, with no common bargaining position, competitive advantage, based on something more than just price. In that case, I believe it is harder for them to get along. These factors make them competitors.* (1-F-I)

Notably, the interviewee (1-F-I) mentions that business stakeholders might be good partners if they represent common interests and do not compete directly. Other interviewees have also mentioned it. Table 46 summarises power structures in Poland.

Table 46 – Summary: power structures in Poland

Component	Challenge	Solution
Power structures	- Policy-makers can only take facilitators' role when other stakeholders can self-organise (but there are few such groups);	- Potential solutions, such as providing incentives for self-organisation, can be ineffective.
	- Determining how much "help" from the outside is reasonable to facilitate the process;	- The policy-makers consider their capabilities and resources (e.g., are there enough people with required qualifications to perform the planned tasks; necessary time to complete the analyses without outsourcing some tasks). Additional arguments that may affect the decision include neutrality, legitimacy, engagement, strategy ownership and commitment to its implementation;
	- Motivating business and non-government stakeholders to get involved;	- access to funding; - non-financial incentives (e.g., networking, prestige);
	- Administrative barriers to stakeholders' cooperation and lack of systemic incentives;	- Reducing administrative barriers and providing incentives through adjusting goals (e.g. in academia). It could be achieved, e.g., through the involvement of other government stakeholders into S3 and inter-ministerial cooperation, to align S3 with other relevant policy domains;
	- Mistrust and lack of "common language" (expressed through emotional and mental distance).	- Establishing relationships between helices by organising special events.

Source: own elaboration

5.1.3. Comparative summary: emerging structures of an organisational field

Table 47 provides a comparative overview of the main issues while setting the S3 governance structure in Lithuania and Poland.

Table 47 – Setting governance structure: comparing main findings from Lithuania and Poland

Component	Dimension	Lithuania	Poland
Place-based component	*Multilevel governance*	Initially had minor importance. Became relevant concerning funding. The issue is still little developed.	Most prominently emerges concerning the distribution of responsibilities and competencies between national and regional levels and the tension between *centralisation* (to achieve synergy) versus *autonomy*. Issues of autonomous funding are crucial. An organised initiative helps regions discuss and agree on the common interest, then presented as a collective voice. The national-level authorities cannot ignore it easily, which could happen to many single opinions.
	Administrative capacities	Challenges arise because of the fragmented innovation system. Regions were not involved in the S3 during the financial programming perspective 2014-2020.	Challenges arise because of multilevel governance and two-tier prioritisation, which may cause fragmentation. The fragmentation of the innovation system is less regarded as a problem than in Lithuania.
Sectoral component	*Sectoral governance*	It is recognised as a drawback and varies across priorities (niches do better).	It emerges as an issue in the regions that applied different approaches to EDP and prioritisation (varies across priorities, niches do better). A staged smart-panel and smart-labs approach is applied at the national level, although not in all priorities simultaneously.
	Balancing influence	Business involvement is the major challenge, along with the business-science cooperation and collaboration in the triple-helix model.	Business involvement is the major challenge, along with the business-science cooperation and collaboration in the triple-helix model.

Source: own elaboration

Multilevel governance becomes especially relevant when different territorial levels are involved. However, policy-makers also plan to introduce regional level funding in Lithuania, even though priorities are defined only at the national level. It could also create a similar situation as formally existing in Poland in the financial programming perspective 2014-2020, where companies may apply for national and regional level funding if their projects fit within respective priority areas.

However, it may be important to see to what extent such substitution of funding occurs in practice or whether projects at different levels differ, e.g., in their technology readiness level.

Hence, initially, Lithuania had priorities and funding schemes only on the national level, subsequently moving to the one (national) level priorities with two-level funding schemes (national and regional). Poland has two-level priorities and funding schemes, encompassing both the national and regional dimensions. Though, in Lithuania, both funding schemes probably will be managed centrally, while in Poland, funds are managed in a decentralised manner.

Thus, the rationale behind two-level funding in Lithuania is varying firms' innovative potential, which appears to correlate with their geographical location. In Poland, a similar problem emerged. For example, an interviewee (19-F-PL) emphasised the weak potential of local science in the selected specialisation domain. Therefore, for both countries, a solution could be to tailor regional-level tools to support innovation activities in the less experienced firms. Policy measures could offer them comprehensive support and mentoring to grow their innovation potential and absorptive capacity. Alternatively, innovation policy at the regional level could also aim at start-ups in the fields with considerable regional potential. Such potential could emerge, e.g., because of the unique resources, solid research base of local HEIs, or presence of other actors, which might serve as an anchor for the local ecosystem. Encouraging experienced innovators to seek support at the higher level (inter-regional, national, or international) would embed the region into higher-level value chains and enhance its competitiveness.

To summarise findings from both cases, it can be concluded that **multilevel governance**:

- If effective, it **supports redistribution of power** between levels and balances the tension between autonomy and centralisation. Efficient multilevel governance implies an agreement on what tasks may be completed at higher and lower levels, considering actual competencies and potential of the involved actors to fulfil the formally assigned tasks.
- **Adds complexity** to the system. However, it also highlights relevant aspects and helps resolve the bottlenecks if organised efficiently. Involving lower levels could ensure more accurate knowledge about activities at the local level and support tailor-made solutions. Adding higher levels (e.g., national or international, involving several regions across different countries) could ensure synergies and enhance cooperation and mutual learning, positively affecting local communities' innovativeness. Higher level, involving an international aspect of multilevel governance, may be especially relevant for a small state

like Lithuania or regions with unique resources within their own country (e.g., regions with maritime specialisation in Poland).

- As can be concluded from the cases discussed, an **organised initiative** enables one **to articulate the issues** from the grassroots to the top in the multilevel governance model. Another critical factor is the empowerment of the organised initiative members with the legitimate mandate to influence policy-making.

Cooperation in a particular specialisation across territories and policy levels might depend upon the level of granularity of a priority, e.g., it is better in the "niche" areas, such as photonic and somewhat difficult in the more "popular" specialisations. The crucial aspect here is presumably determining an appropriate level of clustering or cooperation for specific priorities, which might relate to the industrial aspects of S3 and characteristics of specific sectoral or technological innovation systems.

Hence, multilevel governance involves the redistribution of power. The challenge is finding the right balance between autonomy and centralisation and introducing common standards. Autonomy enables responsiveness to regional needs, while centralisation and common standards help to deal with complexity and eliminate confusion. **Administrative capacities might be aligned** within different governance levels to ensure efficiency and synergies:

1 Starting **at the EU level**, which implies the coordination of work between different units, responsible for innovation-related themes;
2 **At the country level**, which implies involvement in S3 of different ministries that are in charge of the relevant domains (e.g., energy, culture, research and education, digitalisation, transport and mobility and others), and coordination of their work;
3 **At the operational level**, which implies coordination between operational programmes and financial support measures, as well as of activities between implementing organisations.

A **sectoral governance** component is crucial for S3 and particular specialisations' development in Lithuania and Poland. The component strongly relates to specific priorities, and its strength varies. The main findings are that:

1. Sectoral governance might emerge when actors (firms) **depend upon each other**, meaning that there are common areas with collaboration potential. Such areas may emerge when priorities are defined at the proper level of granularity, which is referred to as the *mid-level of granularity* in the S3 guidelines (not sectoral, but also not too broadly defined).

2. Sectoral governance also **"organises specialisation"**, provides orientation for business stakeholders, which may trigger continuous EDP and result in the development of priorities by exploiting the newly discovered potential. "Organising specialisation" also involves leadership, meaning that one or more actors anchor the entire ecosystem around a specific priority domain.

To sum up the above, the following preliminary propositions **on multilevel and sectoral governance** can be made:

Preliminary proposition 1a:

> *From the multilevel governance perspective, centralisation to achieve synergies at the expense of local autonomy could inhibit S3 implementation at the lower levels (considered vertically, across territorial levels, i.e., national-regional).*

Preliminary proposition 1b:

> *Deficits in the sectoral governance component may cause difficulties in attaining critical mass around a specialisation domain at the mid-level of granularity.*

Table 48 compares relational structures and institutional arrangements in Lithuania and Poland.

Table 48 – Relational structures: comparing Lithuania and Poland

Dimension	**Lithuania**	**Poland**
Coercive influence	Strong orientation towards new, designing specific methodology;	Building a new approach on the current legacy;
Influence of past approaches	No immediately recognisable influence; relevant experience perceived as lacking;	Recent experience with approaches is perceived as useful in the context of S3; attempts to incorporate results of the past processes into the new approach;
Determining foundations	Expert analyses;	Results of foresight projects (national level); regions – variable approaches;
Channelling EDP	EDP takes place at the national level, in pre-defined fields, followed by group discussions;	EDP processes correspond to the administrative boundaries (national and regional levels), run separately.

Source: own elaboration

Directing EDP implies establishing the rules and initial conditions under which EDP may run. Some factors that may affect the design of the process concern either the organisational aspects or direction of the search for new opportunities:

- **Coercive influence.** In some places, EDP has started merely because of coercive pressure and policy-makers attempted to design processes from scratch (Lithuania);

- Approach to EDP may also result from **past practices and policies combined with the newly introduced approaches** (common in Poland).
- **Determining foundations for process design.** The approach taken concerning initial analyses determined EDP foundations. So, Poland's foresight projects and expert overviews in Lithuania have made up the foundations for further search. However, there is some difference. In Lithuania, a unique foresight procedure for EDP was designed. Working groups had to identify priorities within broader areas. In Poland, detailed lists of technologies have already been available from the foresight projects, and stakeholders had to merge and narrow that information. The World Bank pilot project on EDP, which had been run in several regions, disseminated such approaches as "smart lab" and interviews as parts of the process. Regions also varied in their approaches.
- **Channelling EDP.** EDP usually covered **multiple search processes** within different working groups, organised **within specific themes, technologies or sectors**. These have often been **pre-defined** by the initial analyses at the specific territorial level (national or regional).

The first two factors, as mentioned above, affect the design of the process: the balance between top-down and bottom-up, degree of participation, and means of stakeholder involvement. The following two factors affect the search direction and determine priorities' boundaries regarding the industry and place-based aspects.

Summing up, EDP and S3 relate to both industry and territorial levels. Industry perspective then relates to answering the question of possible specialisation domains. Hence, the search might be directed towards particular technologies, sectors or combinations of these (cross-cutting approaches). Territorial perspective considers an appropriate level for the search. Initially, S3 implied a regional-level approach, but strategies were also created at the national level. Further, it might be beneficial to consider expanding S3 to the cross-regional approaches on the one side and including a more localised level on the other side. Preliminary propositions 1c and 1d reflect these findings on **EDP design and relational structures**:

Preliminary proposition 1c:

> *The choice to design S3 and EDP as a continuation of the previous approach or as something new has implications for the process. However, it does not inevitably affect the result (e.g., formulations of priorities in the official documents as broader fields with detailed lists of specified technologies), which depends on the chosen method (in both countries, it has been a foresight-based approach).*

Preliminary proposition 1d:

> *EDP in Lithuania and Poland can be characterised as a multi-search process, which runs independently in separate priority domains and within established territorial boundaries (e.g., regional or national). Because of this, the EDP, initialised by the policy-makers, may not fit the natural relational structures between stakeholders that may cross administrative boundaries of the regions, as findings from Poland suggest.*

The involvement of relevant stakeholders in the S3 is a cornerstone of EDP. It might affect power configuration and field logic. Expectations raised for different stakeholder groups and their self-perceived role might also determine S3 governance structure and channel EDP. The following issues could be distinguished concerning stakeholders' involvement:

1. **Engagement of the policy-makers**, which might depend on their perception of their role in the process, and organisational capacity;
2. **Participation incentives** for other stakeholders (business, academia, society) include access to funding and non-financial benefits, e.g., prestige and networking. The self-perceived role in EDP may also act as an incentive (e.g., leadership, ensuring visibility, monitoring the current development of the domain).
3. An established **coalition** allows a dialogue between stakeholders and enables a consistent and coherent process.

Table 49 provides a comparative overview of power configuration and determining factors in Lithuania and Poland.

Table 49 – Determining power configuration: comparing Lithuania and Poland

	Lithuania	**Poland**
Engagement of the policy-makers	Part of the policy-makers perceive their role as an administrator; unable to compensate for deficits in the sectoral governance component; looks for "help".	Policy-makers who deal with S3 take the facilitator's role. However, their engagement depends on perceived organisational capacity; mixed feelings concerning the use of "help", connecting to legitimacy.
Incentives for the business	Financial and non-financial; an appropriate time-frame and level of granularity.	Financial and non-financial; an appropriate time-frame and level of granularity.
Coalition	Roles are defined rather strictly; each stakeholder group is expected to complete its tasks, but some tasks remain not fulfilled; Administrative barriers and trust also play a role.	Administrative barriers hinder adopting perspectives closer to other stakeholders (e.g., rules and incentives in academia); Lack of trust hinders cooperation.

Source: own elaboration

Policy-makers are meant to facilitate EDP. Therefore, their engagement is crucial. Summarising the findings concerning the engagement of the policy-makers from Lithuania and Poland, the following can be concluded:

1. Policy-makers' engagement in S3 depends on their perceived role in the process and their perceived or factual organisational capacity. The perception of one's role varies between administrator and facilitator, implying the scope of competencies and responsibilities assigned to those roles. Perceptions might differ according to the tasks that a public organisation has. Therefore, those policy-makers in charge of stakeholders' involvement and definition of priorities are likely to adopt facilitators' role. In contrast, authorities in charge of structural funds and accountability to EC commonly adopt the administrator's perspective.
2. Results indicate that in the weak innovation systems, with insufficient stakeholders' self-organisation capacities, policy-makers might need to compensate for what well-developed intermediary organisations (e.g., clusters, business support organisations) are doing in well-developed innovation systems. Therefore, the tasks that policy-makers need to accomplish may reach beyond what the initial definition of EDP has implied.
3. An attitude that policy-makers are administrators may also limit their will to coordinate activities and cooperate with others, which is crucial if the system is fragmented and many state organisations are involved, each with their administering tasks. It could also limit engagement in searching for ways to compensate for sectoral governance deficits and lacking other helices' capabilities. Behind self-perception as an administrator might be a view that responsibility for the priorities and ownership of the strategy should be the domain of other stakeholders and not the policy-makers. The view of the self as managers, or leaders, shaping their region's future is then lacking.
4. Policy-makers might compensate for the insufficient capacity to complete the expected task by seeking help from the outside (e.g., consulting companies, universities, local or foreign experts). The range of "help" might vary from editing the documents, collecting information for the analysis, and delegating to organise EDP, up to providing practical support for the stakeholders while developing their specialisation. Doing things in-house and outsourcing some tasks have their pros. Thus, doing things self ensures clear responsibility and ownership of the strategy. Acknowledging limitations and seeking external help might help maintain neutrality and increase the results' legitimacy, especially if the renowned experts are consulted.

Even though stakeholders' involvement, especially concerning business stakeholders, has been challenging, policy-makers perceived it as positive and successful both in Lithuania and Poland. Notably, the initial role of business and other stakeholders within EDP has been detailing and describing priority fields based on their expert knowledge. Hence, initially, the bottom-up process has been used to generate priorities' descriptions and stakeholders as information sources. However, other roles also become apparent, which includes the performance of the following tasks:

1 **Domain structuring.** Leadership and organisational work within a specialisation domain;
2 **Identification of opportunities.** Monitoring the development of a particular specialisation;
3 **Democratic legitimation.** Representation of the broader business community within a domain;
4 **Articulation of interests.** Maintenance of a dialogue and ties with the policy-makers;
5 **Image creation.** Ensuring visibility of a domain in the political arena (e.g., through publicity, international success);

The roles mentioned above are crucial for developing specialisation domains and successfully implementing the selected priorities. However, research shows that many of these roles initially have not been recognised or deemed significant by the policy-makers, and their inevitability became apparent when moving towards implementation.

The following factors might determine stakeholders' motivation to participate:

1. A trade-off between resource dependency and time, which is needed to commit to the process.
2. Reference to the appropriate time frame. Business stakeholders need a perspective for much more immediate results. Consequently, implementation-related issues might be more relevant for them than deliberations on priority wording and description of its content.
3. Making non-financial benefits apparent (e.g., prestige, networking).

S3 implies cooperation between different stakeholders and working towards a common goal. Thus, there is a need for an established coalition between different actors and stakeholder groups (also called helices). However, research findings indicate that such a coalition is not necessarily working well in Lithuania and Poland. As a result, gaps emerge, and some tasks cannot be fulfilled. However, under coercive pressure, other stakeholders (mostly policy-makers or designated organisations, which fulfil the tasks) might need to compensate for the missing engagement of other

helices and take over their tasks. Helix coalition within priority domain is likely to emerge when stakeholders:

1. Recognise mutual benefits from cooperation with other stakeholders (e.g., image or economic relevance for the region or country, new research avenues for scientists, access to funding, inspirations for business ideas or practical solutions for business);
2. Have a shared knowledge base (speak "same language") and a similar level of capabilities to contribute to the common solution (e.g., their professional experience, educational background, research interests). A typical case might be knowledge asymmetry and different stakeholders' positions at the learning curve. Hence, other stakeholders may see no value from excluded stakeholders' participation and decide "over their heads". An alternative step could be that other stakeholders (usually policy-makers) take the educators' role, aiming to enhance the commitment and co-ownership of the decisions.

However, considering a triple or quadruple helix might not be sufficient for S3 to succeed. It might serve instead as an inspiration for an elaborated stakeholder mapping, including identifying relevant organisations and players within specific helices and considering the roles they could have and strategies for their involvement.

Based on these findings, the following preliminary proposition on **stakeholders' roles** and **power structures** can be made:

Preliminary proposition 1e:

> *The development of an S3 priority may depend on the fulfilment of the specific tasks (domain structuring, identification of opportunities, democratic legitimation, articulation of interests, image creation). When stakeholders do not accomplish these tasks and policy-makers cannot compensate for this (with their human resources or help from other actors, e.g., consulting companies, universities), the development of the S3 priority could stagnate.*

Another important aspect discussed in the subchapter has been stakeholder's engagement, which is also closely connected with stakeholders' roles and power. However, because it has been subject to another research question, the preliminary proposition on **stakeholders' engagement** follows under number 2:

Preliminary proposition 2:

> *Stakeholders' engagement in S3 might depend upon their self-perceived role in the process (varying between being a source of information and co-decider) and embeddedness in the network structures, allowing them to leverage the power and affect governance.*

Summing up in simple words, the connection between engagement and power structures is that lacking stakeholder engagement distorts power structures. Thus, formal inclusion of selected organisations or people from business, science or society in the governance structure appears insufficient, and involvement of a broader scope of actors is required. The latter depends on how well networked are specific groups of stakeholders and whether they are conscious about all the spectrum of roles and tasks they have to fulfil, including their actual capabilities to accomplish them.

5.2. S3 documents and implementation

The subchapter aims to explore the transition between defining and implementing S3. First, it outlines stakeholders' perceptions concerning specific S3 processes: prioritisation, implementation and monitoring. Next, the subchapter reveals how those perceptions connect to outcomes in official S3 documents and specifically to the characteristics of priorities. Subsequently, it shows how these outcomes affect strategy implementation and monitoring.

The subchapter follows the same structure as the previous ones. Firstly, it provides an overview of the situation in Lithuania, then in Poland, and subsequently presents a comparative summary for each country and conclusions based on the findings from both cases.

5.2.1. Lithuania

5.2.1.1. Prioritisation

Tying S3 to the EU structural funds, as an ex-ante conditionality, implied that there would be very little funding available for horizontal innovation policy (because, in Lithuania, national funds play a minor role in their scarcity). From this standpoint, significant political barriers to implementing the S3 prioritisation philosophy emerge, as even evidence-based decision-making might lack legitimacy in stakeholders' eyes. Indeed, selecting a limited number of priorities is a political challenge in Lithuania, for the reasons apparent in two following quotes:

> *There should be a mass of other funding beyond the structural* [funding]*, a mountain of money for the same areas. Because the Ministry of Science and Education has that ideology and philosophy from ancient times. Why is biotechnology flourishing in Lithuania? They trace it back to the Soviet era when that area was subsidised from Moscow, still as an institute, with golden roubles. That means one could buy a foreign machine. And then they worked from that, worked, and that is what they have got. It is natural to say that something will get by when one invests a lot. Naturally, one is not investing everywhere and is waiting for something to come by. Therefore, one needs to select areas, invest a lot, and not just the structural funds. That is the biggest problem here because that means telling others that*

> *there is no money. They have to generate and collect that money somehow differently, which probably does not find the solution here. If other money has also to be contributed to S3, what to do with those not priorities? Where to get money for them?* (26-NG-LT)

> *There is the implementation system's problem. It looks at everyone as equal, and there is no such thing as sector development. Although there is great potential, those who are not well equipped remain such losers, and the development never happens. Well, there will be much fewer priorities soon. However, even among some politicians, there is an opinion that Lithuania should have three to five priorities, not 10, not 20, narrow three priorities, and that is it. In the opinion of those methodological groups and most of the experts involved in the process, it would not be very sensible to reduce drastically. Because then the question is, what about the rest of the economy? Technology is also changing, and there is no room to manoeuvre when one fits in such a narrow envelope. I would think the truth is really in the middle. It is better to prioritise a little more but not count it all on the fingers of one hand.* (22-F-LT)

The argument that any innovative firm in the economy should have an equal chance to access funding might be especially powerful when priorities are not inclusive and areas are prioritised based, e.g., on sectoral or technological approach, e.g., biotechnology. With such an approach to prioritisation, a limited number of priorities might be perceived as "picking the winners". Prioritisation then aims to strengthen existing capacity or build a new one in the essential or promising areas. Following this argumentation line, nearly every area in a country or a region has its potential and may flourish if provided targeted support. Hence, it is difficult to discriminate against areas due to, e.g., lack of sufficient critical mass (what if an area is emerging yet and has rapid growth potential?). Hence, making choices might lack legitimacy.

As stated by another interviewee, the aim of inclusive priority setting could be not to select a specialisation towards certain technologies or markets, but setting priorities as a goal, where everyone could work on its achievement:

> *It depends on the accent and the aim. In my opinion, S3 should not focus on what is available today but on projecting what we want to have. It is a matter of self-determination for each state. It is natural that if we take some direction, maybe there are few active players initially. However, if we want to invest in it, more people would appear and develop their technologies. It is probably the goal of turning the vast majority of technologies in the direction we want. The market specialises very well. For example, a clean environment is a clear direction that any technology should contribute in one or another way, even coal mining plants that may not contribute to carbon reduction at first glance. Still, the coal is mined. Creating some technology where, for example, one needs twice as little energy as one does today is suitable for a clean environment. Those, I think, are clear guidelines. Yes, it is broad, but probably to achieve its impact, it should be broad. That is my personal opinion on this issue.* (29-BS-LT*)*

This logic is less interventional than implied by S3, as it is much closer to the horizontal approach, allowing financing anything, contributing to, e.g., a clean environment.

5.2.1.2. Implementation

The S3 implementation results may also depend on the efficiency of dialogue between different stakeholder groups and understanding other parties' logic and needs. As discussed earlier, at the start of S3, various parties had a variable understanding of how S3 had to be implemented, which became apparent in the Lithuanian case. Thus, a horizontal approach to distributing funds was chosen, and all the priorities had equal opportunity to apply. In the following quote, the interviewee refers to the project selection process, when impartial experts select the best projects among applicants across all the S3 priorities. As the quote explains, such an approach did not result in the concentration of resources and targeted support:

> *Impartiality is checked, meaning one or more experts are involved. Thus, a conflict of interest is avoided. Whether such an approach has proven is hard to say, probably not, in most cases. Because the horizontal distribution of that money did not result in some narrow concentration in a specific area, where one could expect some serious breakthrough or very interesting commercial-economic activities, start-ups, new investors. It did not happen. Although externally objectivity was maintained by allocating money horizontally to implement all 20 priorities, it means that the best projects were selected, but that concentration did not occur. Thus, one idea of smart specialisation was concentrating money* [where] *the strong capacity* [exists]. *The public sector, the science sector, the second thing would be business capacity. An innovative business that can produce a product, a service from knowledge, to capitalise knowledge. The question itself would be straightforward. However, it often means that the paramount issue is the activation of the economy, the transfer from the low added value to high added value. Some priorities respond well to this, and some clearly cannot do that.* (27-S-LT)

In the quote above, differences in the perception of S3 purpose are evident. In the interviewee's view, the aim is to concentrate funding on the most promising areas and themes. The policy-makers seemingly intend to support the best projects, even at the cost of scattering funds.

In Lithuania, methodological guidelines foresaw to include stakeholders in priority setting and gather information on the implementation measures. Policy-makers had implemented those guidelines during the priority-setting process, and stakeholders also developed detailed roadmaps for each priority. The roadmaps included detailed plans for the implementation, including what support is necessary during particular stages. However, it turned out that public organisations responsible for administering support measures and assigning funding could not adjust the implementation roadmaps to the rules set for programming EU structural funds. Therefore, the implementation system in its approved form did not adhere to stakeholders' expectations. The quotes below exemplify how stakeholders lose control over the process when it comes to deciding on the forms and extent of available support:

> *Those working groups did not stop, and they prepared further guidelines for implementing priorities. In the roadmaps, they have been looking at how much money one needs, when one needs money, on what basis one needs money, and what will come out of it. They did it all. I would even say they did the map. This priority will need support from the beginning, e.g., for commercialising certain technologies because*

> *one already has technology from the university, which means there is a cluster. One will need support for the cluster and then export support. This priority will need support for scientific and technical laboratories, and there is not enough equipment to do something. Well, that one will need something else. Each priority had something like an action implementation scheme of some sort, what to do now. The ministries that design the priority action plans, describing the priority and allocated money, only partly considered those guidelines. They did not follow the same logic of tools. They chose almost the same measures as in the previous funding period and used them in the same proportions to fund the priorities. It was a bit of a broken logic* [compared] *to what we wanted to do.* (23-NG-LT)

> *In practice, it turned out that it was almost impossible for them* [organisations responsible for support measures] *to adapt to this system of implementation, which is, to adapt to such a programme as a programmed priority, where in reality, each priority has to be followed up, what is going on there. Therefore, those roadmaps designed, well tailor-made, and adapted to those priorities are only partially implemented. Their overall development level is low because there are still standard support measures, common calls, and little adaptation to those priorities.* (22-F-LT)

Therefore, as indicated in the quotes above, a usual approach has been taken instead. Another interviewee denotes sticking to the usual with the expression "we do not work like that" and points the condition that might change the routines, but which is not fulfilled: "the large clients". The logic here is that an individual company may select a matching tool from the toolbox. Therefore, a variety of support measures increases the chance of finding something appropriate (in the following two quotes, support measures are called "tools"):

> *It was quite a diversity in the tools. If someone does not want to, they do not apply for those tools. If there is a need, they assemble the complex they require. We do not have the approach to work with the client. We have disclosed tools, someone came or not — no one bundles* [the tools] *individually. It does not work like, for example, with foreign investors, that a client comes, and then one adjusts a bunch for him. In other countries, it is done individually for the client. If a customer comes, one sees what he needs, finds a tool, gives it a chance, reaches some level, provides other tools, etc. In our case, on the contrary, it means such a universal principle that we lay the tools out. If you want, then go for it. No one follows the progress individually or evaluates it. Well, we work with very small clients. There are no large ones in Lithuania. Maybe it would be possible to work individually with the large ones. So there is no such thing. Agencies are perhaps more fragmented, each providing their tools.* (25-NG-LT)

Some stakeholders may see such an approach as countering the logic of prioritisation, which in their eyes would imply implementation of the priority by tailoring support:

> *It was also requested to prepare a plan of measures, develop the tools. Most of those tools did not come about because there were no directly assigned funds. The funds were distributed horizontally for all the priorities. That means 20 announced priorities, but those priorities do not include funds. There is a common pot, and the government says, well, now we will announce a competition, all will apply for those funds, and we will choose the best. Then selecting these projects and activities becomes not some priority concentration, but such a random, instant decision of an expert group, which is not embedded into some strategic perspective. In my eyes, that is a weak part.* (27-S-LT)

Concerning the quotes above, the notion of "large clients" has an important implication for implementing S3. Thus, S3 underlines the importance of critical mass within priorities. Therefore, if priority would form a coherent pool of related potential projects, which would result in a significant whole if implemented, maybe it would be possible to work with the specific priority as with a "large client", consisting of multiple entities that contribute to a bigger whole. Such an approach would

also be congruent with a tailored-made policy, implied by S3. Hence, it might support the assumption that broadly defined priorities make it challenging for the policy-makers to find good "ways to facilitate the realisation of the potential" as explicitly required by the definition of EDP. Especially when priorities contain lists of technologies that regional stakeholders cannot combine.

Nearly all interviewees in Lithuania held the opinion that in the financial programming perspective 2014-2020, the consolidation of funds, as intended by the European Commission, can not be observed. However, there was no common opinion whether it is also appropriate in the Lithuanian context, as the following quotes demonstrate:

> *Concerning the flow of finance in a specific direction, I guess not. I would not set such a goal either. Because, if we divert much money to some sector that does not have absorption capacity or just where all those processes take a very long time, we will have high risk, unpredictable return, and sometimes maybe low quality.* (34-B-LT)

However, a widespread opinion is that consolidation still happens to some extent despite broad priorities because stronger priorities can better absorb funds:

> *It succeeded somewhat because, although there were 20 priorities, we can easily enlarge them. We can call it a bigger mass, and Lithuania seems to be criticised for having many priorities. However, I do not think that we had many priorities, just a lot of requests. Other countries have followed that major path from the beginning and priorities such as a healthy society or a smart city and the like. I do not think they are narrower and more focused because a healthy society also involves an infinite number of things. The idea of allocating certain sums of money to those priorities was abandoned. There has been a common competition for all. It became clear which priorities can implement high-quality R&D projects. Thus, one cannot say that* [money has been] *entirely spread over all the priorities, as those priority leaders who raised the most funds were clearly visible.* (33-NG-LT)

The following two quotes also note that the Lithuanian approach is moving in the right direction:

> *In reality, projects cannot take place without S3. They still have to correspond to some direction of S3. S3 has overwhelmed it all a bit. However, since it has been around for a very long time, all have adapted. Depending on the need, one can turn the subject to either side. I do not think it is a problem in technological development because it naturally guides people towards the goal set in the guidelines. Having one technology or another, one can pursue a different goal. Because, in most cases, technology can be used in more than one direction. Initially, they had set 20 priorities and six areas. Now they have merged* [them] *so that those areas, even the priorities, have expanded. I do not think there is much difference. Maybe it is easier now, less fragmented, and one can probably have more opportunities to explain how one contributes to one or another direction.* (29-BS-LT)

> *In general, everyone more or less understood and said that the smart specialisation so far was not broad enough and covered a lot, which is probably not the case because there was an actual case when one just could not put an idea somewhere. More specifically, it covered at least 80% of the projects so far. The more some are interdisciplinary, the simpler it is. I do not think it will be 80% with the new one, but maybe two-thirds of the projects. When looking at the details, that circle is already there. Although, in part, not as detailed as before, with 20 thematic specificities. However, it is still a question, what breakthrough innovation can be expected if the boundaries of who can take part in it are already very clearly defined. Here, perhaps I would say that this second new generation of S3 in Lithuania is already moving in the right direction. It is already more responsive to the goal of narrowing it down a bit and concentrating a little more. On the other side, it is already close to that original idea but far from approaching that pure idea of S3.* (36-NG-LT)

Policy-makers in Lithuania also consider introducing mission- or challenge-based support measures to enhance the consolidation of funds. In the following quote, the interviewee explains what the idea would imply for the projects:

> *In the past, there were individual projects or two* [partners]. *From now on, missions would require to involve as broad mass as possible, at least three* [partners], *and necessarily from academia or civil society. What will make it different? The only thing that will bring it together is the common goal, just like the call for* [a support measure] *'Inočekiai' so far. To provide ideas in the field of health, e.g., Covid would be regarded as a challenge. Thus, everyone knows it relates to health and applies. The name 'Covid' gives it more meaning. Does it change the nature of the project? It does not change it in any way - the same projects, only with a clearer purpose. However, the idea is good. It would help to see the effect. It was not bad now, but there was no breakthrough in some areas, no bigger run. Just scattered unrelated projects. Suppose there were several or a dozen such projects, larger, somehow connected, where one ends, and another extends at the same or a different angle. One may solve a technical problem, another a social problem, an adaptability problem. It would make a more significant breakthrough. Only, I do not know how it will be put into practice. So far, there is such a scatter.* (36-NG-LT)

Thus, as follows from the elaboration in the quote above, there would probably be no significant changes from the introducing mission- or challenge-oriented support measures. However, the expectation might be that such an approach could be reasonable to encourage larger projects with more partners and, consequently, a more significant impact. However, there is no assurance that the expectation will be satisfied, especially considering that the guidelines for the practical implementation of the idea are still lacking.

5.2.1.3. Monitoring

Lithuania started monitoring priorities quite early. The first report came out according to the timeline set beforehand. However, misalignment of administrative capacities becomes evident. Because of delays in implementation, at the time of preparing the first monitoring report, the progress could not be measured yet, as the following quote relates:

> *Many of the support measures to implement S3, precisely, measures that provide money to priorities, for those who want to create technologies, were very late. There was no money for priorities. Then [priorities] did not move, or they moved in their way. That is not the progress in the smart specialisation. It was simply natural progress, but not because of strategy or indirectly because of it. Now, we are just showing a layout where there is something, but we cannot say whether it is progress because there was no movement. We draw such a static picture. Is it progress? We have to call it progress, but we cannot say whether there is progress within those priorities.* (23-NG-LT)

Another quote elaborates on monitoring challenges concerning priorities:

> *Monitoring is really challenging because priorities are cross-sectoral. Sectoral priorities are easy to monitor because there are sector indicators. In this case, it has taken a more forward-looking path in technology. Sectors are converging, and those priorities are becoming cross-sectoral. The idea was to monitor cross-sectoral indicators, what products are being developed, start-ups, etc. However, I think that failed because monitoring may not have received as much attention. The thing is that the institutions have not divided which of them will monitor, and MOSTA is currently monitoring, but the Ministry of Economy is also monitoring. Right now, monitoring is based much on the analysis of the first calls for proposals.* (22-F-LT)

Thus, significant challenges related to priorities' cross-sectoral nature and lack of coordination between the responsible organisations (duplication of monitoring function). Furthermore, available statistical classifications for economic activities do not necessarily correspond to the needs of S3, as the following quote explains:

> *Assigning S3 priorities and themes to NACE codes is extremely difficult because they do not correlate. So we are working with experts to assign the most detailed NACE codes and attempt to capture that entire ecosystem of specialisation. To see how it looks without the European Union's structural funds. Perhaps it is strong even without structural support. Furthermore, we look at structural support data, which is easy to pull out. This monitoring can be improved continuously, and we are constantly reviewing it with experts as much as possible. We are working on this with the NACE code assignment, and I think it will get better in the future.* (32-NG-LT)

The quotes above show that converging sectors and cross-sectoral priorities complicate relying on traditional data, such as NACE or similar classifications. Therefore, monitoring organisations have to consider other sources of evidence and the means to collect it. The initial considerations on the Lithuanian monitoring system included three bases of evidence: quantitative monitoring based on statistical data, expert evaluation of the content, and input from working groups:

> *We will probably combine three sources. One source will be the reports we are preparing, based on numbers. We will sum it up there and see some movement, a priority movement. Then we want to hire thematic experts who understand the technologies being developed. We can only measure how much has been quoted, sold, something else, but we do not know the content, how good it is. We will hire experts to tell us how ambitious that content is. The third impulse is to gather those expert groups that worked to talk again because they are currently out, writing their projects and then implementing them. We want to gather them again to continue the EDP. Out of these three* [sources]*, we can tell about priorities according to the method.* (23-NG-LT)

Moreover, to ensure a comprehensive evaluation of S3 and EDP, it might be necessary to interlock priorities' monitoring system with other monitoring systems, especially monitoring and evaluation of support measures. Otherwise, parallel monitoring systems might exist, as in the Lithuanian case:

> *It turned out that the tools have their indicators. The entire system of structural funds and then the priorities with their indicators did not interlock well. Finally, the Ministry of Finance's monitoring system, coded in the support measures, remained the main one. Thus, these are more sectoral indicators, such as business spending on R&D and the like. It is ultimate, and these indicators remain the most important.* (22-F-LT)

Focusing the monitoring solely on the support measures might not be sufficient because it does not allow evaluating the impact of measures against specific priorities and, respectively, tailoring support. It might also not be clear why specific priorities benefit from certain support measures while others do not, e.g., as stated in the quote below:

> *In the system of the structural funds, there is a checkbox. With this checkbox, everything can be filtered by themes. However, does that address the needs of smart specialisation? I do not think so. By funds, one sees very well. One can see funds, participants, companies, projects, content, everything, but what? It simply shows whether a priority is more in demand or less. When we selected them, we picked them according to the general statistics of the country. Now we look at the demand for money.* (26-NG-LT)

The quote below reflects the monitoring system's flaws when evaluating the progress according to the individual support measures and participation in the calls. Such merely statistical evaluation may not reflect actual developments in the firms relevant to the selected priorities. The interviewee relates to the "Intellect", one of the most significant support measures considering assigned and distributed funds. There were several common calls for the applicants within all S3 priorities.

> *We were re-approached that there was no application from the* [priority area] *when the second Intellect call was published. Yes, wait. When one goes through the first call and fails, a company can not turn the topic into something completely different already in another call. It does not work that way. Those who took* [the funding] *received the most during the first* [call] *and were less involved in the second. Then we agreed. Initially, they provided us with the data of the first Intellect call and asked us to evaluate how the directions were involved. We said: wait, provide it together, give us all the data. We will put it together in Excel ourselves. That is not the problem, but give us both* [calls' data]. *Then we will watch, evaluate. It is such an organisational thing.* (28-S-LT)

Therefore, it might be helpful to combine the monitoring of support measures with monitoring specific priorities' indicators to evaluate the impact. However, numerous or broadly defined priorities might make it even more challenging to collect ample evidence and ensure consistency of monitoring approach, as the following interview excerpt states:

> *The original idea was not fully developed. If one started measuring science and business competencies and cooperation levels, then the same method should apply to measure sectors' and technologies' development results and prospects. However, they chose another path, an abstract path, which, in my eyes, shows no progress. One cannot even compare what has changed. They take a broad sector, for which are available statistical data. It is necessary to take narrower sectors,* [meaning] *more work because the Department of Statistics does not collect these* [data]*, or agree with the Department of Statistics to collect detailed data, at the point of technology development or sector development. Then one could have something to compare. Now one does not see the effect. What does it show to take the whole food industry and look at it? It is good if the crisis is over, the sector develops, and the growth is there. Is it because the new product has been introduced or the sector is growing, anyway? Weak points are too many priorities and the inability to see their progress.* (24-NG-LT)

Concerning the quote above, it is worth mentioning that yearly S3 monitoring reports in Lithuania have slightly different indicators each time they are published. After implementation has started, these reports also include a combination of support measures' and priorities' monitoring, according to the achievement of the set goals. Moreover, after updating Lithuanian S3, monitoring indicators are published for the seven priority fields (which became priorities) instead of breaking it down to the 22 themes (mainly corresponding to the former 20 priorities), as done before the update. Therefore, it might be even more challenging to assess from the monitoring data a development direction of a single priority with a broad label, e.g., energy and sustainable environment (includes three themes) or IT (includes five themes).

Table 50 summarises S3 processes in Lithuania.

Table 50 – Summary: S3 processes in Lithuania

Process	**Challenge**	**Solution**
Priority setting	Ensuring equal opportunities to everyone while consolidating resources	Formulating priorities as goals to ensure that everyone who can contribute to its achievement is eligible for funding
Implementation	Aligning tailor-made approach for specific priorities with the rules of the funds-distributing system	Potential beneficiaries can choose from the common pool of measures and apply for those they deem suitable.
Monitoring	Monitoring the development of individual priorities beyond their performance concerning the absorption of funds from support measures. Challenges arise from the broad nature of priorities.	Combing available statistical data and assigning it to specific priorities.

Source: own elaboration

5.2.2. Poland

5.2.2.1. Prioritisation

In Poland, the official document describing S3 is an annexe to the Enterprise Development Programme until 2020, which:

> *... is an executive program of the Strategy for Innovation and Efficiency of the Economy "Dynamic Poland 2020" (SIEE). SIEE is one of the nine sectoral integrated strategies at the national level to ensure the implementation of the development goals of the Polish economy, defined in the Long-term and Medium-term National Development Strategy. The main goal of SIEE is a highly competitive economy (innovative and effective) based on knowledge and cooperation* (own translation from Kancelaria Prezesa Rady Ministrów, 2014, para.1).

The document describes how priorities were defined, presents analytic material, and outlines further work on priorities' specification, implementation, and monitoring. As an annexe to this analytic document, working groups within selected priorities have developed extensive descriptions (list of specific technologies), updated yearly.

Approaches to S3 in Polish regions often differed from the national approach. Regional S3 strategies have been frequently integrated into extant regional innovation strategies (usually as annexes) or other relevant documents, e.g., strategies for regional development. In some regions,

the significant influence of academic partners can be noticed in the S3 related documents and reports. An example could be the strategy of Podkarpackie, where it is stated explicitly that scientists from the Politechnika Rzeszowska authored the strategy in cooperation with other stakeholders (see Woźniak et al., 2015, p.2). Also in Śląskie, documents and reports are being prepared in collaboration with consortia led by the academic organisations, such as the University of Economics in Katowice, the Silesian University of Technology, the Central Mining Institute, or the Science and Technology Park "Technopark Gliwice". In such cases, the text veers towards becoming excessively academic, includes a review of the concepts based on scientific literature, but sometimes lacks specificity in operationalising these concepts, e.g., does not mention what activities or tasks are decisive to conduct in a specific context or who is responsible for what. Thus, occasionally, somewhat nebulous concepts or formulations appear without apparent relation to the envisioned actions for particular priorities. An example might serve a notion of the *smart market* (including *smart market development* and *smart market creation*), which frequently appears in Śląskie's RIS for 2013-2020 and is among its priorities. As stated in the English version of Śląskie's RIS:

> *"Creating smart markets for future technologies. This priority regards the opening of businesses, institutions and society in the region for participation in value chains and usage of new business models in relation to the expanding scale of transformations in the direction of the so-called smart markets and the related prosumer behaviours. The priority's essence is to strengthen competence both for operating this sort of markets from the technological and social perspective (consumer behaviour) and building lasting ability to create and participate in such markets. The objectives under this priority are oriented for making breakthrough technological and product changes"* (The Śląskie Voivodeship Assembly, 2012, pp. 26-27).

From the above, the context of the *smart market* concept remains unclear, despite that reference to it constantly appears in the document, which talks about *smart market creation* or *smart market development*. Therefore, even though the strategic document constantly underlines the importance of the *smart market* and refers to it across priorities, it might be difficult for non-academic stakeholders to comprehend what kind of markets are envisioned in the strategy. Thus, although the strategy specifies what measures are relevant for creating *smart markets*, it is hardly possible to assess whether those are appropriate for achieving the goal.

In Poland, there are also arguments favouring horizontal, goal-based prioritisation. The following quote follows the argumentation line, according to which anything fits the priority as long as it serves its goal:

> *For me, each study that will lead to an increase in safe food is a study that potentially feeds into safe food, including genetic modification or food with a specific purpose. Of course, there are more and less receptive sectors or technologies. However, I do not determine which technology or sector will enter the safe food in advance, whether it will come in. Whatever may be the most abstract. I presented at the parliamentary committee that space technologies are also used in safe food. Everyone looked at me as if I was an idiot because it was not precise. If energy is* [gained from] *biomass, it is also closure to the chain of safe food values and waste management from food production. It also goes into safe food. Everything in the value chain suits, but one does not see it in KIS. It is hard to say. All KIS and none have the potential for safe food. Mining can also fit if we talk about soil conditions in some plants' production. If these goals are not included, and the soil and scale tests are not in food but regard oxide and shale gas accumulation, they do not suit. Potentially it is any and none, depending on what it is for and its use. At the goal level, I mean mixes. In any sector, any technology theoretically applies.* (6-RG-PL)

Thus, the quote above pictured an inclusive priority based on goal and closure to the value chain. The following quote provides a similar view of priority, which takes an inclusive approach and provides policy-makers with arguments against including any area into priorities.

> *At the moment, we had many such activities that combined and aggregated smart specialisations since we wanted interaction among different specialisations that can contribute to the creation of the added value. Recently, we established a national smart specialisation, "circular economy" from KIS, which dealt with water, raw materials and waste. On the one hand, it was of great importance in terms of communication, because we showed that this topic of "circular economy" is very much on the agenda. On the other hand, we allowed interaction among these three areas and discussions on joint projects, so we think about it differently. When it comes to the activities of working groups aiming at smart specialisations: changing smart specialisations, updating, requests on merging, renaming, and changing scope, or an utterly bottom-up movement of active people, an initiative group that looks forward to establishing a new smart specialisation, such conclusions also came to the ministry. Although these are precisely analysed because we have an extensive list of specialisations, we do not want to do such art for the sake of art. For example, the space sector is very demanding for a space specialisation. We say that all technologies used in space are in individual smart specialisations. There are automotive, nanotechnologies, and electronics new materials. In sum, the cosmos can also survive from it.* (4-NG-PL)

An important point comes out at the end of the quote, where the interviewee provides an example of the space sector. Hence, the goal is not to develop the space sector as such but to use existing opportunities to apply space-related technologies to transform mature and declining sectors (e.g., farming or automotive).

Another interviewee notes that there should be some direction or specificity, even when defining priorities in general terms. Such an approach is in line with the assumptions of S3, elaborated by Foray (2015) or Online S3 Platform (n.d., "What kind of priorities", para.3).

> *The thinking results from knowing that the essence of smart specialisations' success is distinguishing ourselves from others. If we have 15 or 16 tourism specialisations throughout the country, nothing will come out of it. When there would be 16 "quality of life", we can say "quality of life" is our smart specialisation, but then there is a question: what exactly is inside? If we answer this question, even in general terms, some entrepreneurs will say: "OK, we are not watching each other. It is good that*

> *someone has created such an opportunity for us. In this perspective, we want to generate as many projects as possible and do relevant things, primarily for us entrepreneurs." In the next 5-7 years, we would say that it was profitable to water them because we may not be talking about the "Quality of Life". We will talk about "Biotechnology in nutrition" or something else. So we all learn it. I approach it calmly, even though I disagree with certain assumptions. The following years give us many opportunities to learn and, fortunately, some of us learn. It is the most important thing.* (19-F-PL)

However, the interviewee also admits that it is a learning process, and people need time to learn.

To sum up, in Poland, prioritisation logics varied between the national and regional levels. At the national level, priorities were defined based on extensive technology lists available from the two foresight projects. The process focused on integrating their results and reducing dimensions by aggregating the lists, which resulted in a **tree-like prioritisation pattern** (broad field covers one to several priorities that serve as labels and include different technologies that may fit them).

The information from interviews and S3 documents, complemented with the analysis of priorities, encoded into Eye@RIS3 (https://s3platform.jrc.ec.europa.eu/map) for all 16 regions in Poland reveals several common patterns for defining priorities at the regional level:

- **Priorities**, formulated **as goals** (e.g., Safe food in Mazowieckie, Quality of life in Podkarpackie, Green Economy in Śląskie). This type of priority may also reflect closure to a value chain, e.g., everything, making food safer, fits.
- **Sectoral** priorities (e.g., Chemical industry in Małopolskie, Metal and casting industry in Świętokrzyskie; Medical Industry, pharmaceuticals and cosmetics in Łódzkie). These priorities aim to renew specific sectors or support their innovative development;
- **Horizontal** priorities, supporting all other priorities, (e.g., ICT in Podkarpackie, Industry 4.0 in Dolnośląskie, Eco-innovation in Kujawsko-Pomorskie). Solutions developed in those priorities may benefit other priority domains;
- **Integrated** priorities (e.g., Medical technologies in the area of civilisation and ageing-associated diseases in Pomorskie, or priorities in Lubelskie, following the logic to integrate selected technologies with specific value chains). This type of priority comes closest to capturing the logic of S3 and integrating technology, sectoral, and goal approach into a specific priority, pointing a development direction. However, sometimes they are still defined broadly and include several technologies and sectors, as shown in the following example from Lubelskie: "Bioeconomy. The use of agricultural and industrial biotechnology, nanotechnology, biophysics in the value chains of sustainable primary production, bio-resources and food production in the sectors of pharmaceutical, energy, eco-

business, agro-food, chemical, paper, wood and furniture, information services" (quoted from https://s3platform.jrc.ec.europa.eu/map).

5.2.2.2. Implementation

Findings suggest that priorities have been defined broadly, and there is a relatively large number of them. Still, at the beginning of the financial programming perspective and shortly after approving official S3 documents, some interviewees have been optimistic that some limiting factors and potential for consolidation of funding exist:

> *This support is not as dispersed as before. There are smart specialisations, and everyone tries to adhere to them, so they limit already. Thus, not that support receives anything but only the projects that fit S3.* (2-BS-PL)

Hence, it could be possible that consolidation happens during implementation, despite broadly defined priorities. However, many other interviewees in Poland noted that the consolidation of funds was not achieved, and the current form of S3 might be considered the beginning of the process. As the following quote acknowledges, consolidation to the extent desired by European Commission has not taken place yet:

> [Consolidation] *not really* [happened]. *The ROP implements the S3 for the first thematic objective, which has the most money. The multitude of smart specialisations in regions resulted from the fear that this money would not be invested. Thus, we would be struck by the fact that we do not spend money on R&D. The consolidation took place, but certainly not* [to the degree] *expected by the EC because these are not very narrow fields. It is part of many projects, and it was probably the intention of those who created these specialisations. The fear is that if we narrow down the areas strongly, there will be interesting projects we do not know about today, which will not be possible to implement. That is an example of the trap I talked about a moment ago - reconciling the programme with the theory*. (11-RG-PL)

The following quote plausibly explains why it might be difficult to consolidate the funds with S3. Thus, the problem seems to be a lack of a market for all the available funding designated for R&D:

> *There are significant problems with absorption in general. However, I wonder if there are any entities outside of S3, which would like to apply. We did such an analysis, and it turned out that it is practically impossible that these smart specialisations could reduce the number of entities because there were fewer entities conducting R&D in Poland than the number of beneficiaries needed to spend these funds. This assumption was not possible initially. I mean, these programme assumptions were not likely to be consumed by the market. So, in my opinion, smart specialisations did not make it any more difficult.* (17-NG-PL)

The quote below relates to the consolidation of environments and specific projects, which happens on a much smaller scale than defined by smart specialisations. It might be perceived as emerging in a bottom-up mode when several actors come together and initialise more extensive projects. Specialisations then may serve as some general orientation whether it is worth initialising cooperation in selected area:

> *Maybe the specialisations themselves may not* [consolidate]*, but the environments are consolidating, and new, cool projects are created from "Horizon" or other sources. For example, the* [name of the project] *will now be implemented in* [name of the region]*, The Digital Computing Center for Medical Applications. Such things happen, but it is more a consolidation of the environment than the specialisations themselves. However, the specialisations themselves also seem to direct the thinking about what is worth doing. If our entrepreneurs or scientists are looking for partners, then it is a question about the potential of areas, and specialisations always indicate the key potential. If the projects are in these areas, then it is easier.* (10-RG-PL)

Thus, it might be challenging to reach a certain critical mass of projects around a value chain, as it has been advocated by some interviewees who saw the potential to consolidate specialisations towards specific goals. As the quote below explains, there have been separate larger projects, but not a concentration of projects around the value chain:

> *There was nothing like two complementary projects, and we are talking about some continuity of the production chain, supply chain, and value chain. There were some big projects. A good example is INNOTABOR, i.e., where the project presented an improved model of a rail vehicle. However, it was one project, not three separate ones. Maybe it is good because it was easier to manage. At this point, it was transferred entirely to the beneficiary. However, the administration has mainly withdrawn from animating this sectoral cooperation.* (17-NG-PL)

Therefore, the consolidation can be observed at the micro-level rather than at the mid-level of granularity, aspired by S3. S3 priorities in their current form appear to be insufficient to generate a critical mass at the mid-level without additional facilitation. It may require a more intense engagement from the policy-makers and their further support to stakeholders, even after priorities have been defined.

However, in Poland, the collected evidence indicates that policy-makers did not possess sufficient administrative capacity to support all the specialisations equally in terms of facilitating EDP and consolidation within broad specialisation labels towards mid-level of granularity. For example, at the national level, PARP supported by consultations and orchestrated EDP in 12 thematic areas as part of the *Monitoring of National Smart Specialisation* project carried out by the *Ministry of Entrepreneurship and Technology* and PARP. The exercises followed a staged *smart panel* and *smart lab* approach, which has been developed for EDP in Poland, based on the recommendations from the World Bank Pilot project (World Bank Group, 2015/2016). These resulted in well-elaborated *Business Technology Roadmaps*, including mapping relevant areas and sectors, envisioning development perspectives (scenario analysis) and recommendations for the implementation. Table 51 provides an overview of the areas and sectors with EDP supported by consultations orchestrated by public authorities.

Table 51 – EDP supported by consultations orchestrated by public authorities in Poland: covered areas and sectors

	Business Technology Roadmaps	**Year**
1	Space sector in Poland	2018
2	Innovative technologies in plastics	2018
3	Energy-efficient construction sector	2019
4	Pharmaceuticals, including high value added pharmaceuticals	2018
5	Video games used in various areas of life	2018
6	Preparation and implementation of feasibility studies for R&D and innovation investments for the heating appliances producers	2019
7	Selected vessel types and port transport and logistic systems in Poland	2019
8	Sector of innovative, environmentally friendly fertilizers	2019
9	Innovative packaging in circular economy	2019
10	Medical robots sector	2019
11	Smart Farming sector	2019
12	High quality food	2019

Source: own elaboration, based on https://smart.gov.pl/pl/analizy-i-raporty

It is worth mentioning that in some regions, EDP has also been supported and orchestrated after priorities have been set, e.g., in Pomorskie by a consulting company Deloitte for a medicine-related specialisation. Therefore, it can be concluded that even though there are actions taken to facilitate the consolidation of environments in the S3 priority domains, these are not comprehensive because not all the selected priorities are covered. In other words, consolidating actions occur to a lesser extent than implied by the official S3 documents because of the lack of administrative capacities of the policy-makers to offer comprehensive facilitation for such a broad range of selected specialisations.

When it comes to tailoring support to the needs of specific domains, Poland's situation at the beginning has been that POIR was prepared separately from S3 priorities, and both documents are complementary. The following quote explains what sources of information were used to prepare POIR. Notably, the work on S3 and the needs of specialisation domains are not mentioned:

> [When] *programming POIR, we used several tools. The first thing was all the evaluation studies that summarised our previous programme, the Innovative Economy programme. Here was much information on the effectiveness of instruments, on the effects of support. It was used. So were the recommendations from previous evaluations, which began to be evident in the middle of the programme. It was one piece of information and data source. The second source was data on the economy. Some areas in the economy are developing better, and others - slower. Companies are more inclined or less inclined to invest. The third source of information is the most important entities in the economy, whether associations of companies or trade unions with which we cooperate, for example, a monitoring committee. All these entities were consulted and participated in developing the programme. Of course, it was the administration, but including our so-called social and economic partners.* (3-NG-PL)

During the priority-setting process, stakeholders had not developed detailed implementation plans for each priority, with clearly defined implementations stages and necessary support measures during each of them. Data collected for Poland do not indicate such an approach. However, Poland has some experience implementing the *sectoral research programmes*, a support measure when stakeholders (facilitated by the public agency NCBR) prepared R&D agendas that NCBR then funded. It has also been continued as a measure within POIR. However, considerations of whether the support should be tailored to specific priorities are left for the future:

> *We also have to answer whether it is the case that different areas of specialisation require different support instruments, or it is also the case that every specialisation can thrive in every instrument. I do not have a ready answer to this question. While working on S3, the Commission asked us whether we would adjust various support instruments to smart areas. For now, it does not work that way, except for sectoral programmes. All instruments are for all specialisation areas, but we will probably have to think about it. Is it so that, e.g., different specialisations require some specific support? Does the financing of cooperation with business environment institutions make sense somewhere and not elsewhere? For example, let us say loan financing - somewhere companies are already advanced enough, and it works. In other areas, they do not - there must be subsidies because companies cannot pay back such loans. So this is probably an analysis to be carried out for the future, based on the existing support instruments on the one hand and national smart specialisation on the other hand.* (3-NG-PL)

Using financial instruments as an alternative support measure might indicate whether policy-makers have sufficient capacity to understand the specificity of particular domains and appraise a project's risk against possible benefits. Poland has already introduced such instruments, but there is still little information on the country's experience. The quote below elaborates on the related considerations:

> *Another element is that funds were selected to manage these instruments. For a fund to invest in an R&D project that commercialises a solution, it must know the potential, type of solution, and a sector where something like this operates. However, it should be noted that some of the created seed funds, entities that looked after start-ups in Poland, were mainly operating in the IT field. As part of the conducted research,* [we discovered that] *relatively few people managing these funds would like to risk* [an investment] *in innovative projects with a not easily predictable rate of return. Thus, perhaps as before, they will prefer investing in IT projects where this rate of return is better predictable. I am not saying that this action was wrong. One had to start with something and create these frames for thematic profiles, e.g., advertise the offer, talk about such action, organise meetings, invite starting entrepreneurs and scientists to pitch. This animation and attraction of entities were in place. Only, there were a lot of competitive instruments just for projects with this profile. If NCBR was to specialise in R&D projects, there were few of these projects, so there was such a temptation that they could reach for IT. Also, the PFR and PARP had very similar instruments, so the supply of these projects was low.* (17-NG-PL)

In the quote above, two potential problems become evident. Thus, initially, there were very few experienced people who could manage financial instruments as venture funds properly. On the other hand, there is a potential problem with the demand for such instruments, resulting in public agencies expanding the range of potentially eligible projects. Hence, there is a risk of competition with developing private funding entities in specific segments, perceived as "secure" investments, e.g., IT projects.

5.2.2.3. Monitoring

In Poland, a particular challenge was to utilise statistical data for S3, as the following quotes make clear. The quote below refers to the divergence between the available statistical data and the needs of S3, which became clear already at the stage of programming:

> *I think you know the limitations of monitoring smart specialisations with statistical data. It was cosmos, and it is still cosmos. Indeed, knowing that we are the world's largest exporter of currants, I think that could little say whether nanotechnology should be developed in Poland or not. So,* [there is] *divergence between the data from the PKD, including those showing pro-development indicators, of course, exports, product sales, or patents. In sum, we had very little output from the macroeconomic analyses. The most important feedback was direct conversations with companies, although information asymmetry and reaching all entrepreneurs with R&D ideas is another pair of shoes*. (4-NG-PL)

Hence, at the beginning of S3 implementation, no solid system was still in place. Despite some considerations on what data could serve both national and regional levels, another interviewee admits it may take several years before the system is available to the stakeholders:

> *It is not a simple matter, especially concerning some data. It is simply not there. As a part of such cooperation with the regions, we developed a list of common indicators. A list includes a minimum set of indicators necessary to monitor S3 at the national and regional levels. Some of these are data regarding EU Funds, which we have collected roughly. They have to be sorted a bit, but they are available. Some are data available in public statistics, and some are data that nobody has collected yet. It is perhaps the most difficult because we have to order the data if nobody collects it. As part of the innovation department's project, such data will be collected, or a method of obtaining it will be worked out. Sure, these abilities are growing, and this project is crucial to achieving a state of knowledge and such availability of these data, as assumed. However, I think it will be a few more years before there will be such full availability of data and easy access, a website where everyone can log in there and get the data they need.* (3-NG-PL)

The quote below describes the problems with statistical data even more in detail:

> *We had the biggest problems with showing statistical data and processing these data. We are struggling with challenges related to showing the effects and investments in S3 and the limitations of our GUS. The GUS is present with us in a project that aims to bring us closer to translating smart specialisations into PKD and NACE. We will see how it works and pass it all through product codes. The problem is, the results are going to be very-very approximate. So we operate based on qualitative research, surveys, feedback from entrepreneurs and monitoring the pipeline of projects submitted to NCBR, PARP. We know which specialisations they are in, how many projects there are, whether they are good or bad, whether they pass through this sieve. However, the general innovation statistics of industries drifts away wholly. Only patent statistics give us some feedback, but all the data collected by GUS - we can hang them on a peg. We still have a problem with that.* (4-NG-PL)

Thus, monitoring in Poland relies upon quantitative and qualitative approaches. Especially quantitative monitoring is seen as challenging, and data are deemed insufficient and difficult to adjust for S3. The problems with quantitative data elaborated in the quotes closely resemble those in Lithuania and concern primarily too approximate results due to a mismatch between the scopes covered by statistical classification units and priorities. Qualitative data are assessed more positively. Also, the approach is similar to that in Lithuania: priorities gain numeric indicators

assigning to them values according to NACE or corresponding national classifications (e.g., PKD in Poland), as the following sample quote confirms:

> *When we go down to the research and evaluation level, every time we move from sectors to KIS, then for the needs of a study, such KIS operationalisation is made, these PKDs. So, we look at which KIS are included in which PKDs. We do such work, quite conclusive: sorting, operationalisation of these PKDs to KIS. There is also an expert discussion in our projects, i.e. experts' comments on whether this placement is too wide or too narrow. Recently we had a study presented to working groups. Because working groups are such bodies, providing the most crucial expert knowledge on the subject and whether the identified companies operate in these KISs. Formerly, it was according to industries or sectors, simply checking after PKD, and most likely after PKD and PKWiU, it is service classification. It is also done now, but it is not straightforward. However, all PKDs and company profiles are checked.* (5-NG-PL)

As follows from the quote above, translating priorities into current statistics might bear a risk that the numbers do not reflect the essence of a priority (especially if these are trans-sectoral). Hence, quantitative monitoring requires much effort and resources.

Given the difficulties elaborated above, in Poland, the S3 monitoring system at the national has been developing during the financial programming perspective 2014-2020. In 2020, the online tool Smart Radar was introduced, which allows visualising the data for particular indicators (although some of them only in an aggregated manner and not for specific specialisations). While conducting the Monitoring of National Smart Specialisation project, PARP prepared a comprehensive evaluation plan, with the first reports, including ex-ante evaluation, set for 2017 (for the detailed plan and an overview of already published reports, see Appendix 11).

Regarding the regional perspective, the findings are based on the descriptions of 16 regions provided in the PARP report (Pierzchała et al., 2021) analysis of monitoring reports while preparing for the interviews and information from interviewees. These sources suggest that approaches and development of the monitoring systems vary across regions. However, repetitive patterns might be observed. Thus, sources of evidence include:

1. Analysis of available statistical data and data from implementing programmes, including data collected by the EC, e.g., Horizont 2020 (quantitative data);
2. Information collected from stakeholders (including qualitative studies, interviews with beneficiaries);
3. Supplementary analyses and specific evaluations (as an integral part of monitoring or singular studies); Such evaluations are usually completed externally and address special themes (e.g., clusters, RTOs, barriers for business-science collaboration);
4. Informally gained information, which is not visible in the reports (e.g., conversations during meetings with stakeholders, events).

Statistical data were the most common source, and every region used it, albeit to a different extent. There were also different approaches to utilising the data in the S3 monitoring:

1. Benchmarking with selected regions (e.g., in Podkarpackie, individually selected for every specialisation);
2. Contextual monitoring (e.g., economic and scientific-technological context);
3. Monitoring of indicators for specific specialisations;
4. Specific composite indices (e.g., *smart index* in Śląskie).

Many regions also used some form of qualitative monitoring. Interviewees considered this type of information to be more valuable than statistical data. However, qualitative studies have been planned for larger periods than quantitative monitoring reports because of their resource intensity. Some regions also ordered specialised evaluations or analyses from external organisations. However, this practice is not that common because of the high cost. Finally, regional authorities that closely cooperate with stakeholders and actively facilitate S3 have opportunities to access information informally, which may enhance their understanding of specific issues and partially substitute qualitative studies. However, this means of gaining information was mentioned only sometimes and not always associated with monitoring.

The most common barriers for the monitoring at the regional level include:

1. Lack of **resources** (e.g., human, financial), insufficient support from the national level. Quantitative monitoring, based on available statistical data, is not sufficient, which makes comprehensive monitoring challenging and costly;
2. **Non-precise** or **biased data**. Broadly defined or interdisciplinary specialisations make it difficult to use statistical data and assign PKD or NACE to specific specialisations. The data from implementing ROPs may also be biased towards certain specialisations because, in some regions, beneficiaries may select only one specialisation while, in reality, their project relates to several of them;
3. **Lack of** important **data** (e.g., certain firm-level data; data on innovations in non-beneficiary firms; statistical confidentiality);
4. **Complex monitoring systems**, which partly lack coherence and flexibility of adjusting the indicators to the changing reality;
5. **Stakeholders get tired** of continuous reporting, which may affect representativeness and reliability of findings;
6. Deficient **communication** between different bodies involved in managing S3.

Benchmarking regions to the “optimal” solution, PARP report (Pierzchała et al., 202,1 p. 104) classifies Polish regions in the following categories (based on the EDP and monitoring approaches, and accounting for regional specificity):

- Leaders (3 regions);
- Followers (4 regions);
- Regions with moderately developed systems (8);
- Lagging regions (1).

The classification presented above shows that nearly half of the regions are better situated than the rest, which may indicate the differences in their*administrative capacity*, which conditions regions’ ability to implement different steps of the S3 process.

Table 52 summarises S3 processes in Poland.

Table 52 – Summary: S3 processes in Poland

Process	**Challenge**	**Solution (applied or envisioned)**
Priority setting	Integrating perspective of goal, technologies and sectors into a clear priority.	No uniform solution was recognisable yet. Approaches vary across regions and priorities. At the national level, a tree-like pattern dominates. The four most common patterns can be recognised at the regional level: priorities as goals, sectoral, horizontal or integrated priorities.
Implementation	To consolidate specialisations while ensuring absorption of funds.	No clear solution was recognisable yet. Some environments consolidate themselves independently of S3. A staged smart-panel and smart-lab approach to EDP is applied at the national level, but it covers only part of priorities simultaneously.
Monitoring	To monitor the development of individual priorities beyond their performance regarding funds’ absorption from the support measures. Challenges arise from the structure of priorities and two-tier S3.	The monitoring system has been developing gradually, and most reports and the online tool *Smart Radar* were publicly available in 2020. Approaches across regions vary, but most are based on a combination of a quantitative approach (accessible statistics) and qualitative information (e.g., from studies or gained informally).

Source: own elaboration

5.2.3. Comparative summary: Documents and implementation

Table 53 provides a comparative summary of S3 processes in Lithuania.

Table 53 – Comparative summary: S3 processes

Process	Lithuania	Poland
Priority setting	Tending towards a horizontal approach, everyone should have a chance; goals are often perceived as an appropriate priority definition level.	Priorities vary from goals through technologies to sectoral approaches. Many or broad priorities because of the fear of not being able to absorb the funds.
Implementation	The implementation system is not tailored to specific priorities. Beneficiaries adapt. Implementation start has shown that priorities have to be defined broader. Thus, consolidation is not directed but could happen accidentally.	The implementation system is organised similarly to Lithuania, but the range of support measures is much broader. Thus, beneficiaries still adapt to the system but have more choice; support available at two levels; Consolidation of environments in some priorities independently of S3.
Monitoring	Monitoring is regular, primarily quantitative. However, no sufficient evidence is available on the development direction of specific priorities.	Monitoring varies across regions. Still, a coherent system is lacking. The qualitative aspect provides valuable insights, but quantitative is challenging (although quite advanced in some regions).

Source: own elaboration

Concerning prioritisation, there might be three different traps. Possible continua evolve as follows:

- From goals to prioritisation;
- From inventorying to prioritisation;
- From focusing on separate elements (with the purpose of developing specific technologies or sectors) to integration.

One potential trap to the prioritisation process stems from defining priorities as goals without specifying technological means to achieve them and omitting sectoral dimension – potential industries to address. Slipping into the trap may lead to horizontal innovation policy and the duplication of efforts, contradicting what S3 aimed at improving in the European innovation policy landscape. Duplication might occur because selected goals are nearly identical. That is because the global trends (e.g., industry 4.0, digitalisation and ICT based smart solutions) and challenges (e.g., climate change, population growth, the ageing population in advanced economies) drive these goals. Global trends and challenges also find their echo in the EU objectives (e.g., “green deal”). Thus, priorities selected in this manner are driven by isomorphic mimetic pressures. Therefore, a step further towards prioritisation in the sense of S3 would be to select the combination of tools and

economic actors who could use these tools and contribute to the goals' achievement. The regional potential might be the basis for such selection.

Another trap implies that priority contains an inventory of technologies that might be relevant and are strong in the region (such analyses can be sophisticated and include different selection and benchmark criteria). However, as in the first case, it also avoids prioritising the results. All technologies that pass specific criteria are selected. Even though such an approach allows a region to monitor its technological development directions and provides awareness about its economic structure and strengths, it could also limit support for new developments. Therefore, strategies need regular updating and reviewing of the detailed descriptions of priorities. Such an approach may demand highly qualified experts in the selected priority fields. A potential risk is that economic partners might not devote sufficient time to such a task. Thus, the academic sector becomes the principal "gatekeeper", and strategies become "science-driven". If descriptions become too specific, many actors from the government sector, business or society might withdraw from the debate. Therefore, the work of boundary spanners and coordinators between specialisations may be challenging to conduct. As a result, the risk of duplication of technologies might emerge, with resulting confusion.

The third trap might stem from the perceived purpose of prioritisation. Prioritising based on specific sectors or technologies and focusing on their development might be perceived as an exclusive and "picking the winners" approach, resulting in lacking legitimacy. Such priorities might also be perceived as pushing the region towards path dependency, opposing the goal of S3 to transform industries and foster economic renewal. Therefore, even though building or strengthening capacities within particular sectors or technologies might be a legitimate goal of innovation policy, S3 was initially not intended as a suitable tool for this. As already mentioned, it implies a critical mass of relevant actors that might transform the use of their resources and know-how towards new application domains, with targeted public support. The following **preliminary proposition on prioritisation** can be formulated:

Preliminary proposition 3a

> *If priorities are defined as goals, S3 becomes more horizontal (because a broader range of business activities can fit into them). If priorities are defined as certain technologies or sectors, S3 tends towards a sectoral approach.*

Deficits in the formulation of priorities may affect implementation and monitoring. Thus, the implementation system in Lithuania and Poland has been programmed separately and not in the working groups, which worked out priority definitions, which is a standard of programming ESIF in the EU, to avoid a conflict of interests. Despite that, the same working groups developed the roadmaps in Lithuania, which have been modified and not fully implemented by the policy-makers. Consequently, potential beneficiaries have been left with a choice of support measures, which were the same for all the priorities. Given such a situation, consolidation of funds would be possible if several projects, supplementing each other, would be implemented. As a result, a micro-system within a specific priority could emerge, narrowing down an initially broad definition. However, none of the interviewees supported the view that such development occurred. On the contrary, the majority admitted that consolidation has not happened as intended by the EC.

Other interviewees reported different observations concerning beneficiaries and innovative firms. Usually, beneficiaries adapt their projects to priorities to fit within S3. However, it may also happen that firms cannot identify themselves with detailed priority descriptions or that priorities are defined so broadly that firms do not recognise where and how the development has to take place. Besides, part of the relevant actors was not even aware of S3. On the one hand, these observations might indicate that firms adapt their activities and channel them towards prioritised development. However, on the other hand, the lacking involvement of relevant actors diminishes the legitimacy of the prioritisation process and inhibits clearly defined interventions.

Another drawback of priorities in their present form (i.e., interdisciplinary, intersectoral, relatively broad in scope) is that they are challenging to monitor while using available statistical data and standard classifications of economic activities. Quantitative data collected by the statistic departments are of little use for evaluating the development directions of a specific priority resulting from its implementation. Thus, when designing S3, monitoring issues have not been considered but left for the near future. Accordingly, it turned out that the monitoring system might be nearly as difficult to adjust to priorities as the tailor-made implementation system. To sum up, at present, quantitative monitoring provides information about the general priorities' development (but not detailed enough to recognise various directions within the broader priority). Qualitative monitoring supplies information about firms' needs. Hence, it can be hardly expected that monitoring at this level will be sufficient to support EDP and decisions on narrowing down the options. Concerning **implementation and monitoring**, the following **preliminary proposition** can be made:

Preliminary proposition 3b:

> *There is a lack of serious evidence on whether S3 priorities may develop towards the mid-level of granularity in Lithuania and Poland because the monitoring system does not provide decisive information. Providing such information is challenging because S3 priorities, as they have been defined in the official S3 documents for 2014-2020, do not correspond to the conventional statistical categories, and primary quantitative data for S3 are not being collected.*

5.3. S3 actors and interaction mechanisms

The subchapter outlines the mechanisms that affect isomorphic processes and outcomes of institutionalisation. During the research, two mechanisms could be distinguished. One mechanism refers to the diffusion of the initial S3 assumptions among relevant actors belonging to the organisational field. It implies that assumptions are implemented in an intended way, reinforcing them. Another mechanism implies that various actors may understand those assumptions differently and act according to their interpretations, not necessarily congruent with the intentions of S3. The subchapter also elaborates on how the interplay of these mechanisms takes place.

5.3.1. Lithuania

The interviews revealed a pattern of how the S3 concept diffused among actors. The pattern strongly resembles what is already known from the neo-institutional theory and, particularly, the management fashion perspective. As the following quote outlines, first, it is a relatively narrow expert circle, which interprets the meaning of the concept and attempts to translate it into practical implications, considering given context:

> *The first idea came to science and government in 2012, when the European Commission announced that S3 priorities would be needed. It was first such an idea that it could be a longer inclusive process based on participation and data. And then it has already begun developing in such an expert circle in which innovation policy analysts, science and some other organisations, have developed the idea of how this could happen methodologically.* (22-F-LT*)*

The following quotes outline how the institutional work is taking place to persuade other broader groups of actors and surge the concept's acceptance level by increasing its scope. The first quote reflects upon work to change the attitudes of the relevant actors in the government sector:

> *It was a wholly new thing. Officials viewed business involvement negatively, as it was seen primarily as lobbying and a war of interests. On the other hand, there was no experience of working together, and much justification was needed. There was a whole preparation stage of about half a year, meetings with ministries, politicians, different people. Proving* [them] *that it is the right way to make it possible to reconcile those interests methodically in such a way that one's interests do not overwhelm that discussion. There was much scepticism, really a lot. Many people did not believe that someone could benefit from this and that it was possible to control. Since it was the first* [time]*, the entire process has possibly pierced*

> *many future processes, but some fears and scepticism were confirmed. At the same time, new results have emerged, showing that such a process can occur and be useful. It was considerable fear and disbelief. The process finally took place, and it achieved half of its results.* (22-F-LT)

Therefore, institutional work aimed to remove barriers to the institutionalisation of S3 assumptions raised by already established institutions (mirrored in beliefs and views). Precisely, the interviewee reflects that difficulties emerge when actors realise the consequences, which collide with already institutionalised views and approaches. The same pattern can also be observed in the following quote, however, at a different level. Thus, the interviewee refers to the extensive work to persuade a broader range of stakeholders, particularly the business.

> *It was a tough challenge. It was a very extensive process because many people had to be involved. It took much discussion and many things to agree on: what to do and what not to do. The search for consensus takes resources, time, just such human work. It was hard because there was much scepticism. After all, when it was seen where everything is going and realised that the process should end up with proposals for what to fund and what not to fund, came people who said: "Stop, you will do the process, and then the ministries will fund it as they see fit, will do as they please, and you are wasting your time and wasting our time getting us involved in your discussions here." It was very difficult to prove to the people that no, well, believe us. We will try everything and do so neatly that ministries' policies will be evidence-based. Now we have that the ministries adhere to the smart specialisation. It is not funded entirely chaotically.* (23-NG-LT)

Hence, various challenges emerge throughout the work of diffusing the concept and its assumptions. Examples include:

1. Logistical challenges - involving a large number of people, searching for consensus;
2. Overcoming scepticism - stakeholders were sceptical of whether their time is worth paying because of the previous experiences with public administration, resulting in certain expectations concerning the government's approach;

The following quote shows that making S3 apparent to other stakeholders is complex and may easily fail despite the best intentions. The passage refers to implementing S3, more specifically, obtaining funding for projects, and elaborates on why some priorities show poor results:

> *Some rules were written until the detail. It was bureaucratic, and the process of getting support was very complicated. If STRATA shows some poor results now, it is in specific specialisations. I work with S3 priority of a Creative and Inclusive Society. It is not a priority with some ultra-good outcomes. Still, it was presented in a bureaucratic, complex way so that both business and the potential participants did not even recognise themselves in those papers. In addition, there was no proper publicity. This S3 process remained in the circle of experts, and various measures were developed in the Ministry of Economy and Innovation. Still, society and the business community were not widely informed.* [It was not] *made public, benefits were not explained, no explanation was given why it was done, etc. A weak point I see, is the communication in this process. Because basically, every expert involved became like an ambassador for smart specialisation. We were all able to speak and explain to the public. There were several reports, but they drowned in the overall flow and did not make a more significant policy.* (37-BS-LT)

There are several important implications from the quote above. First, it shows that a detailed description of the priority did not reflect how the potential beneficiaries perceive themselves. Second, in the interviewee's view, the S3 process remained in the expert circle, despite all the attempts to involve a broader range of relevant actors, especially the business. Indeed, discussion protocols from the working group meetings within the priority *inclusive and creative society* reveal that business has been under-represented, compared to, e.g., academic sector, as shown in Table 54.

Table 54 – Stakeholder Participation in EDP: inclusive and creative society (LT)

Discussion Round	**Participants (number)**		
	Science	**Business**	**Government**
1	12	6	6
2	9	3	5
3	13	6	4
4	13	6	6

Source: own elaboration, based on "Įtrauki ir besimokanti Visuomenė. Pirmoji Diskusija", 2013, p. 2; "Įtraukios ir kūrybingos Visuomenės Grupės antroji Diskusija", 2013, p. 2; "Įtraukios ir kūrybingos Visuomenės Grupės trečioji Diskusija", 2013, p. 2; "Įtraukios ir kūrybingos Visuomenės Grupės ketvirtoji Diskusija", 2014, p. 2.

The following quotes demonstrate that stakeholders may have a variable understanding of S3, which is not necessarily in line with the initial assumptions:

> *Probably in 2013, we started talking about smart specialisation, and some events began. I went to such an event in Riga. After that, I read guidelines 100 pages long, the S3 Guide by JRC. During an event, the Ministry of Education and Science presented. Thus, I realised they did not understand what EDP meant, and it was apparent. After that, in private conversations, I told some consultants to go to the Ministry of Economy, make them aware, and say that something needs to be done because, so far, everything is going not in that direction.* (34-B-LT)

In the following quote, the interviewee points out that there is a need to advise stakeholders and make it clear how to understand the document:

> *Agencies can advise perhaps more on implementation if one needs to talk about the process for which the document will be used. Because it was probably also the case with S3 that different readers read that information differently for different purposes.* (31-NG-LT)

Thus, interpretations of the same document may vary, and policy-makers may need to clarify what interpretation applies. The quote above also reveals that specific state organisations become in charge of interpreting a part of S3, which immediately concerns their work.

5.3.2. Poland

Interviewees from Poland outlined similar aspects and situations concerning the diffusion of the S3 concept as in Lithuania. The quote below denotes how S3 emerges as an academic concept and then travels to the world of policy practice because of coercive pressure:

> *There are two such stages related to the creation of S3. The first stage was when we got acquainted with the topic and the issue, and the topic was just unknown, so it was more of an academic topic than political. And then the second stage, there is such a cut-off date, the EC published the documents regarding the new financial perspective, and there was a direct reference that S3 must be developed. And then, it was that a particular discussion ends only at the academic stage. A discussion begins at the political level, how to define these specialisations. These seem to be the two primary elements.* (2-BS-PL)

In Poland, policy-makers also had to pursue institutional work to diffuse the concept among the broader range of actors:

> *We conduct such information campaigns because people rarely realise what these smart specialisations are. It is associated with something sublime, with space rockets and so on. We show that R&D can be carried out in each sector, suspected of a traditional approach, such as agriculture or vegetable technology. There is much saturation with these technologies, so people do not know. It is a challenge.* (4-NG-PL)

However, in reality, even those immediately involved with innovation-related topics may still not be aware of S3 and the situation in their region, as the exemplary quote reveals:

> *I think that the idea of professor Dominique Foray and the EC largely remained only the idea of those interested in the topic despite it being written and talking about it a lot. Even though we live in the age of the Internet, globalisation, and so on, probably four years after adopting the* [name of a region] *voivodeship strategy, I met with entrepreneurs in a science and technology park for lunch. These were people not accidentally met in a village, but in a science and technology park during the discussion about the innovation and good examples of the regions' companies' development. Therefore, they tell me during lunch: "What are these smart specialisations? Do we have any specific?"* (19-F-PL)

As a solution, policy-makers are planning to involve facilitators (sectoral S3 governance component) to pursue the work of concept dissemination among relevant actors:

> *A substantial area, supported by the leader, will also be the promotion, PR of these specialisations. To encourage as many people as possible who may not have heard about it so far or do not know or cannot define their benefits in participating in structures such as smart specialisations. They will also be present at international fairs through such promotional materials. Well, also, this is the direction we are going.* (7-RG-PL)

In Poland, PARP has carried out a semiotic analysis to understand what stakeholders associate with smart specialisation (see Goch-Kenawy, 2018). The following quote points out how important it is to educate the public about the smart specialisation concept if EDP has to be sustained and stakeholders – engage in the process and advance their regional development in line with S3:

> *We hope that this concept* [smart specialisation] *will be promoted and apprised, which would make the EDP much easier. If entrepreneurs knew what this specialisation is, they would be more willing to engage in such processes if we invited them. What can we, as an administration, do? Probably it is a problem for all countries. I was at an event in Oslo, the smart regions. One entrepreneur from Finland was on the stage, the most innovative entrepreneur in Finland. The leader asked what it is like to be a smart company within the smart specialisation. A lady from the R&D department said she had not heard of smart specialisation until yesterday. It is just that the entrepreneurs do not know the subject. The leader was surprised, and* [the entrepreneur] *asked: "Why should I know?" Entrepreneurs operate in an industry, trying to be innovative and effective. Thus, it is a DG REGIOs issue. DG REGIO replied that it is now probably a task for all countries and the EC to communicate about the S3. Semiotics analysis was a very interesting study. It is such a big challenge to build a good message. Because the word "taste" is associated with something else, not necessarily with innovation as we understood it in the administration or public centres.* (5-NG-PL)

The quote below elaborates on how stakeholders' capacity to engage in the relevant discussions, update knowledge and learn, shapes their interpretations of the concept:

> *Stimulating development policy by the EU is quite inherent. One tries to do what was done in earlier periods, repacking it. The human factor is also significant here because few people deal with it seriously, for example, at universities. I mean, many people deal with it, but with a jump, without reading these source texts, for example, or taking part in the international discussion on it, but reading secondary sources and trying to do something quickly. As a result, neither students nor graduates understand it later. Those people who have been in the system for some time, i.e. officials responsible for it, not to mention politicians and advisors, do not update their knowledge. They do not learn those new things, which is quite tragic. The level where those environments set S3-related trends at the European level practically does not break through to the Polish mainstream. Paradoxically, sometimes there are such embarrassing situations that the executive officials better understand S3 and EDP than advisors who fly from project to project, answer questions quickly and work with the least effort. Thus, unfortunately, in Poland, when we think about innovation policy, it is very much influenced by these factors, related to the shortages of human capital in the milieu of people who should deal with it.* (20-F-PL)

Thus, when relevant people do not have access to the most up-to-date information, they might lack the necessary knowledge to implement the S3 concept appropriately in their regions and countries. Consequently, what is being implemented might be incongruent with the initial assumptions of S3.

5.3.3. Comparative summary: S3 actors and interaction mechanisms

The pattern observed in Lithuania and Poland has been practically identical, as shown in summary in Table 55.

Table 55 – Summary: interaction with S3 concept

	Similarities	**Differences**
Concept dissemination	From expert circle and academia to broader range of actors; *From a strategic level towards implementation and monitoring (which can be noticed from the discussions in the previous subchapters).*	No remarkable differences could be observed.

Means of institutional work	Discussions, educating activity.	Semiotic analysis was conducted in Poland to assess how smart specialisation is perceived.
Challenges and issues	Concept not known in all the relevant circles; Misinterpretation; Lack of shared understanding.	No remarkable differences could be observed.
Changes	Attitudes (from supporting everything to the need to prioritise; from top-down to the bottom-up) Context; Focus.	No remarkable differences could be observed.

Source: own elaboration

For the current subchapter, the following preliminary propositions **on mechanisms** can be formulated:

Preliminary proposition 4a

> *The S3 approach and its outcome might depend on an interplay between different stakeholders' interpretation of the concept and possibility for the shared learning.*

Preliminary proposition 4b

> *S3 assumptions may diffuse among different stakeholder groups (scope) and reach different levels within the same group of stakeholders (depth), supporting S3 framing, congruent with these assumptions.*

Preliminary proposition 4c

> *Clashing interpretations of initial assumptions of S3 might result in modified behaviour of policy-makers and other stakeholders, which compensates for knowledge gaps through adding new elements, blending partial knowledge with existing practices, or ignoring S3 assumptions.*

Thus, as the concept diffuses, stakeholders may adapt it to their own needs or context. Therefore, reinforcement of the initial assumptions might not happen, but the concept may be modified. It could be traced in the interviews concerning different contexts when interviewees reflected that certain activities or procedures had been adapted, or that specific practices could not be introduced in a given context.

5.4. S3 institutionalisation, isomorphism, and decoupling

The subchapter aims to explore the effects of isomorphic pressures on the institutionalisation of S3. It deals with coercive, mimetic and normative isomorphic pressures separately.

Because mimetic and normative isomorphic pressures stem from peers (Boxenbaum & Jonsson, 2017), the interaction between actors from different regions plays an important role. Such interaction can occur during joint initiatives. Several initiatives are relevant for S3, which involve Lithuania and Poland, including some Polish regions. Interviewees have mentioned several of them. Also, to prepare for the interviews, especially in the last stage, participation in various initiatives was researched, and interviewees were asked to elaborate on their experiences.

Therefore, to ensure that the context of learning when reading the quotes is clear, the first section of this subchapter introduces selected initiatives. It also summarises Lithuania's and Poland's engagement in them. The next sections follow the same pattern as in the previous subchapters of chapter 5 and provide an overview of findings separately for Lithuania, Poland and a comparative summary.

5.4.1. Engagement in isomorphic learning

Countries and regions may engage in various initiatives with their peers that enhance mutual learning and improve policy-making. There are several initiatives at the European level, which were started to support regions with various aspects of S3. Other initiatives regions initialised themselves to address their joint needs. Some initiatives do not deal primarily with the S3, but they are an important source of networking and mutual learning between stakeholders from different regions. Therefore, regions may reap these benefits if policy-makers and other actors engage in different initiatives. The selected initiatives presented below are examples discussed in the thesis and include:

- Policy learning between regions from different countries;
- Learning between regions of the same country (Poland);
- Initiatives dedicated to other stakeholders that foster international cooperation and learning from the perspective of sectors and technologies.

5.4.1.1. Interreg policy learning platform

Interreg Europe policy learning platform is an initiative that allows national and regional policy actors to improve their policies through learning with partners in international projects. Table 56 lists the selection of *Interreg Europe* projects related to various S3 aspects and provides an overview of Lithuanian and Polish participation.

Table 56 – Selection of relevant Interreg Europe projects dealing primarily with S3

Project	Policy Objective	Regions/Countries
BEYOND EDP	To improve the design and implementation of the Entrepreneurial Discovery Process (EDP).	Łódzkie
BRIDGES	To enhance industry-led Centres of Competence (CoCs) as RIS3 implementation units.	Lubelskie
CLUSTERS3	To adopt cluster policies to improve S3 implementation.	Lubelskie
COHES3ION	To align sub-regional innovation policies with regional S3.	Mazowieckie
CREADIS3	To involve cultural and creative industries (CCI) in S3.	
ECORIS3	To support knowledge transfer from RTOs and HEIs to regional private companies.	Lithuania
HIGHER	To improve the design and implementation of policy instruments to promote collaborative innovation projects.	Lithuania
IMPROVE	To better manage and implement Structural Funds Programme.	
INKREASE	To reinforce the collaboration between research and business communities and favour the exploitation of research results.	Lithuania
INNOHEIS	To encourage higher education institutions (HEIs) and their research and innovation infrastructures (RIIs) to participate as enablers of S3 and the EDP.	-
MANUMIX	To improve monitoring and evaluation of regional innovation policy-mix for advanced manufacturing.	Lithuania
MARIE	To align the concept of Responsible Research and Innovation with the S3 concept.	-
MONITORIS3	To develop S3 indicators, methodologies, monitoring systems.	-
P2L2	To improve regional innovation policies for advanced materials.	Lithuania, Podkarpackie
RELOS3	To implement regional Smart Specialisation Strategies (RIS3) in a local context.	Wielkopolska
S34GROWTH	To promote new industrial value chains through interregional cooperation.	-
S3CHEM	To implement S3 with regards to the chemical sector.	Mazowieckie
TRACS3	To support regional innovation infrastructures to build research excellence.	Lithuania

Source: own compilation from Morisson & Pattinson, 2020, p. 21; https://www.interregeurope.eu/

As can be seen from Table 56, Lithuania participated actively in different projects to improve its S3 policy. Also, Mazowieckie, Lubelskie, Podkarpackie, Łódzkie, and Wielkopolskie engaged in the selected projects. Complementary to the *Interreg Europe* platform, specific platforms are dedicated to the macro-regions, for example, *Interreg for the Baltic Sea region* or *Interreg Central Europe*. Lithuania participated in 16 innovation-related *Interreg Europe* projects and led three of them. Poland (including regions) took part in 28 projects. These numbers include S3 related projects, identified in Table 56.

5.4.1.2. Peer-to-peer learning

Peer-to-peer learning initialised by the S3 Platform is another source of mutual learning and opportunity to find good practices. S3 Platform provides information on the rationale, objectives and approach of the initiative:

> *"The peer-review workshops bring together regions and countries for mutual learning and exploration of ways in which RIS3 can be developed. The S3 Platform aims to create an open and trusted learning environment where practical and conceptual aspects of RIS3 can be discussed and explored through challenges and experiences of individual regions. The workshops have two main objectives. The first objective is to allow regions meet their peers, the European Commission staff, academic experts and others to discuss common issues related to smart specialisation. The second objective is to allow regions and countries to peer-review each other's work on RIS3. Each region or country under review presents its current work on RIS3 along a template prepared by the S3 Platform. The template covers main features of the RIS3 process as suggested by the RIS3 Guide"* (European Commission, n.d.-e).

Peer review based learning has been taking place in two phases (European Commission, n.d.-e):

- Peer-Review Workshops in 2012-2014 (17 workshops, with reviews of 53 regions and 15 member states)
- Peer-Review Workshops from 2015 had a slightly different format, and topics moved from strategy development to strategy implementation issues.

The initiative has been well-received by the regions. During the first phase, Lithuania and Poland have reviewed their strategy development process at the national level. Additionally, Polish regions of Pomorskie, Świętokrzyskie, Lubelskie, Kujawsko-Pomorskie, Mazowieckie, Małopolskie, Łódzkie were reviewed. From 2015 onwards, both Lithuania and Wielkopolskie participated in two workshops. Also, Podkarpackie and Pomorskie used the service once.

5.4.1.3. Regional Forum for Smart Specialisation

The Regional Forum for Smart Specialisation could serve as one of the sources of mimetic and normative isomorphic pressures in Poland. It emerged as an initiative of the Kujawsko-Pomorskie region, and it was established to strengthen regional competitiveness based on smart specialisation through (Dondelewski, 2013):

1. Setting uniform criteria for the implementation of smart specialisation as well as support and financing measures based on cooperation with partners;
2. Ensuring the correct implementation of specialisation within the regional development process, in line with European Commission's regulations and the Europe 2020 Strategy.

Considering the organisation of work, additionally to the representatives of regional governments, the Forum may involve experts and regional partners and intends to serve as (Dondelewski, 2013):

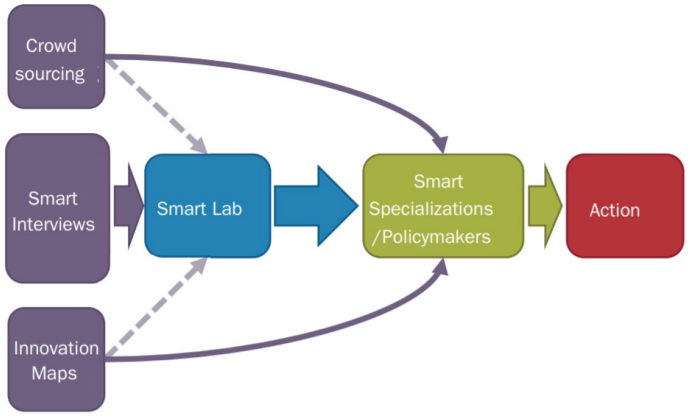
1. Dialogue platform for the regions, with the:
    - Exchange, information, experiences and competence building;
    - Multilevel cooperation of partners;
    - Activities related to specialisation interests of local governments and the introduction of appropriate support mechanisms.
2. National (operational) Platform for smart specialisation:
    - Tools and instruments for cooperation within smart specialisation;
    - Partnership and consortia-based cooperation as part of supra-regional projects;
    - A coherent system of implementation and monitoring of S3.

Therefore, the Forum could serve as a source of mimetic isomorphic pressures in its function as a dialogue platform. Its second function as a national platform for S3 may foster the emergence of common standards and practices among regions, being a source of normative isomorphic pressures.

5.4.1.4. The World Bank pilot project

Another initiative at the regional level is the World Bank project, run as a pilot in five Polish regions. A simplified model of the EDP and its elements, which was developed during the pilot World Bank Project in Poland, is presented in Figure 9.

Figure 9 – *The elements of the EDP process "made in Poland"*



Source: World Bank Group, 2015/2016, p. xvi.

Accordingly, *"smart Labs (SLs) are expert groups built around firms in a selected business area"*, including different stakeholders: leading firms representing selected economic areas, academia, local authorities and business support institutions (World Bank Group, 2015/2016, p. xxii). As stated further in the World Bank report, the purpose of smart labs should be to validate smart specialisations based on their potential and identify emerging ones. The main sources of information for the smart labs come from the *smart interviews,* which are *"firm-level interviews (...)* [that] *aim to identify key drivers for and constraints on SME innovation, identify the key attributes of companies that could benefit the most from public intervention, and take stock of key business and technological trends, as perceived by the companies"* (World Bank Group, 2015/2016, p. xix). Additionally, smart labs may get supporting information from the *innovation maps* that are supposed *"... to collect and analyse data from thousands of grant applications submitted annually to national and regional innovation support institutions"* (World Bank Group, 2015/2016, p. xxiv). Finally, *crowdsourcing* has been modelled on the recent trends in the field of open government, such as the Open Government Initiative in the US (World Bank Group, 2015/2016, p. xxv). The aim of introducing this element was to broaden EDP's reach and involve entrepreneurs who do not participate in smart interviews or smart labs. Creating such a platform is expected to overcome a lack of trust and intensify dialogue between a broad range of stakeholders and policy-makers.

5.4.1.5. Other stakeholders' learning

Natural learning and transfer of experiences might occur between stakeholders other than policy-makers because such learning can build upon institutional proximity given by a sectoral or technological innovation system. It occurs due to the embeddedness in networks (coupling

structure) and might happen, e.g., in collaborative projects. Such learning type aligns with sectoral or technological innovation systems' logic, as sector or technology-domain specific institutions and practices might be shared. A platform for this type of learning provides the *Horizon 2020 - The Framework Programme for Research and Innovation* (further Horizon 2020) (see European Commission, 2011). Learning in Horizon 2020 takes place when partners from different countries engage in joint projects. Large projects might include even over the dozen of partners, but there are at least three, as specified in the eligibility requirements:

> *"For standard research projects – a consortium of at least three legal entities. Each entity must be established in an EU Member State or an Associated Country"* (European Commission, Directorate-General for Research and Innovation, 2014, p.21)

There are also various other initiatives, which might support mimetic learning. Examples include the Vanguard initiative, where member regions from different countries initialise pilot projects (https://www.s3vanguardinitiative.eu/), or the *European Network of Innovation Agencies (TAFTIE)*, where agencies may share their experience (for more information see: https://taftie.eu). Other initiatives not discussed in this thesis, for example, *European Future Innovation System Centre (EFIS)*, aim to unite scholars, practitioners, and organisations influencing innovation system approaches and thinking in their countries (for more information see: https://www.efiscentre.eu).

5.4.2. Lithuania

5.4.2.1. Coercive isomorphic pressures

Findings indicate that Lithuania faced numerous challenges with S3. Thus, interviewees reflected that specialisations might lack facilitation and leadership, especially from the business sector, hindering their development. Consequently, it may indicate insufficient business community engagement or deficits in organisational structures within this group of stakeholders. However, generally, the process has been perceived as well-organised by most interviewees, and the EC approved official documents. Consequently, policy-makers perceive the documents as proof of compliance with the S3 assumptions in Lithuania, as the following quote demonstrates. The quote reflects upon the risk that S3 areas possibly could not represent business activities:

> *Such a risk would be significant if the business would not be involved. However, the business was involved. Its involvement was less than that of science, at least in numbers, but business was everywhere, as a fact. Because we have all the group lists, we have all the follow-up protocols, and so forth. The Commission has even asked us to provide that, and we have given it to them. I think the business representatives took part everywhere. There were six* [working groups]*, 30-40 people* [each]*, plus all sorts of extra people.* (23-NG-LT)

Besides, the interviewee elaborates further on the possibility involving those who are not members of any associations, therefore have no representative:

> *They could participate in such a group in person because there were different people. There were entrepreneurs and representatives of large factories and other entrepreneurial people. They were still fewer than scientists. However, everyone could suggest to the group leader: how to act, how not to act, what to do, what not to do, what technology should or should not get there.* (23-NG-LT)

The quotes above highlight the large scale of business involvement and refer to the documents that should prove this involvement. Indeed, stakeholders have been extensively involved, especially during the initial exercise, in the second stage of the process. Experts selected the S3 fields during the first stage, and in the second stage, working groups were set to detail the specific investment priorities within these fields. However, it is the second stage of the process, which is continuously brought up as EDP's backbone, while the first stage, when priority fields have been selected, is kept less apparent. The second stage has been about explicit content, selecting priorities and explicit technologies for investments. At this stage, stakeholders have also prepared implementation roadmaps, where necessary support at different phases has been specified for the priorities to implement. However, the ministries have not implemented them in the way the working groups engaged in prioritisation intended, which indicates that the roadmaps have not been developed jointly with relevant government stakeholders responsible for allocating funds.

The exercise appears in a different light after updating priorities a few years later. The fields, initially selected by experts, became actual priorities. Consequently, priorities selected by the stakeholders became themes to be financed within these priorities and descriptions developed in the working groups have been eliminated from the strategy. The reasons behind this choice are ensuring flexibility and responsiveness for the rapid technological developments and keeping priorities inclusive without the need to revise strategic documents whenever a new promising opportunity emerges.

Difficulties to involve stakeholders in the process might have been the consequences of damage in the past. In the Lithuanian context, the interpretation of what business involvement implies for policy decisions resulted in challenges for the stakeholder's involvement. The Soviet era's negative consequences prevailed, resulting in negative views towards business engagement in state affairs. The persistence of the attitude also in the context of S3 has been summarised by an interviewee in the following words:

> *They are lobbyists. How should they decide about funds?* (22-F-LT)

Another quote also exposes the conflict between a positive and a negative view of business involvement:

> *Business* [stakeholders] *have been involved, maybe even too much. I mean in a positive way.* (23-NG-LT)

Reference to *business involvement in a positive way* may reflect the need to justify the involvement and reflect informal institutions. Therefore, tensions arise. Stakeholder involvement, including business, is demanded by the S3 logic implied in the initial assumptions, but it conflicts with informal institutions (cultural views and social pressures on policy-makers).

Attempts to involve business are also difficult due to the lack of trust. As noted by an interviewee:

> *The business did not want to believe things would change, and there was a need for a great persuasive effort.* (23-NG-LT)

However, even if relevant stakeholders have been involved, dialogue may be challenging because of deficits in S3 structures and discontinuous processes, leading to broken trust. An interviewee describes the involvement of experts in S3:

> [Working group] *experts followed methodology rigorously, "as school kids", worked sincerely, prepared roadmaps* (28-S-LT).

Thus, roadmaps have not been implemented according to their authors' expectations. Hence, the trust may be damaged, and the reaction of disappointment emerges. However, as the interviewee (28-S-LT) noted, the experts attempt to make new suggestions and not give up. In the interviewee's view (28-S-LT), there moved something, and the mindset changed, implying that there was no way back to the former practices. Stakeholders feel empowered to speak up if something appears wrong or unfair. However, enthusiasm is somewhat dropping. Another interviewee (22-F-LT) noted that even though the learning process has been set, one impulse may not be enough (afraid of bouncing back if nothing further happens).

Moreover, because of deficits in the stakeholders' involvement, selected specialisations do not develop organically and lack a sectoral governance component ensuring leadership, identified as crucial to S3 in this research project.

5.4.2.2. Mimetic isomorphic pressures

The results indicate that mimetic isomorphic pressures are more likely to disseminate practices and approaches if the examples stem from countries and regions similar to the imitating country in many extents: e.g., corresponding economic development, level of bureaucracy and other contextual factors. In such cases, imitation and convergence of approaches may occur unconsciously, or practices can be easily adopted due to sufficient absorptive capacity in the innovation system. The quote below elaborates on what might be an *appropriate* example to follow:

> *One needs to take the same level of development.* [Countries or regions] *of more mature development have different funding opportunities. The* [suitable examples] *are all the countries with similar economies, where small and medium-sized enterprises prevail. Economic development level, such as GDP per capita, is similar. There are similar possibilities. One can learn from everything. In Poland, there are some things funded quite well. We have invited Poles and looked at their schemes. The region of Andalusia, because I was there, is very similar. Small and medium-sized businesses prevail, and the level of development is very similar. They may use more financial instruments, and we still use grants. It was a long-standing proposition to fund more through financial instruments. However, it was returned to grants. I do not even know why those grants are necessary. Well, they are a more common mechanism.* (25-NG-LT)

The quote above refers to the level of development, which might be assessed with such indicators as GDP per capita and economy's structure (e.g., SMEs prevail). The business structure indicators might serve as possible proxies for the needs of enterprises by type of economic activities they pursue (e.g., one could quickly assess whether high- or low-value-added activities dominate). Thus, such a quick assessment could indicate that similar support measures could gain similar results and learn from actual experiences instead of trial and error. However, finding relevant experience could be challenging when an approach is deemed new, as in the case with S3 prioritisation:

> *There has never been such a process in Lithuania before. It was just the first such pilot attempt. We researched how other countries did. I recall it was 2012-2013, and in other countries, there was no S3 process yet, unless something went on in parallel. We just delved into prioritisation and looked for such foresight based examples. We looked at the UK's methodologies and other countries, but absolutely nothing to rely on from Middle and Eastern Europe. No one had such an experience in general. Because so far, those priorities have always been for everyone. In that sense, there were no priorities, and in science, they were copied from the general European Priority Programme.* (22-F-LT)

When "good practices" are available from the advanced regions, it could be challenging to adapt them because of the insufficient absorptive capacity. As the following quote reveals, even though the interviewee is aware of the possible good examples, the problem with their implementation emerges. Lacking knowledge of details makes it difficult to imitate successful practices if specific rules and guidelines are lacking:

> *Austrians had set priorities a long time ago. Almost all Scandinavian countries, prosperous countries, have learned to specialise a long time ago, without S3. They do not scatter money but consolidate them. Only when these requirements arose for the structural funds this was new. In the old countries, in the sense of welfare, they have been applying that practice for a long time, specialising, and they have long*

> *ago concluded that one cannot or should not keep and support all areas equally. One still has to pick strengths, where one would like to be after 40 years and then go in that direction. It is just such a strategy of states. DG REGIO took the idea from DG RTD, and the idea of the ex-ante conditionality for the Structural Funds 2014-2020 came from that. However, we do not get those rules in time. Because what does it mean? One can put together the requirements cleverly without directly saying what will be implemented. The implementation guidelines appeared much later. The devil lies in the details.* (26-NG-LT)

When a similar institutional context is lacking, the solution to the problem might not be found because the same problem is also lacking, as elaborated by an interviewee. In the excerpt below, the interviewee talks about challenges because of the restrictions related to S3. In the quote's context, it is important to know that there has been much dispute among different actors in Lithuania because of the interpretation regarding compliance with the state aid rules. The Ministry of Finance, which is also accountable to the EC for the proper use of ESIF, was limiting possibilities to design support measures for the collaborative business-science projects. Several interviewees referred to this rigorous interpretation of state aid rules as the restrictions concerning S3 implementation and noted that other countries interpret it differently. The quote stems from a broader context, where the interviewee elaborated on the learning opportunities and sharing experiences with international peers.

> *We asked Estonians how they deal with the same issue* [of restrictions] *about S3. They did not even understand what we were asking. They do not even have this type of problem because they do not have such restrictions. It was just a chance to ask. Of course, one will find out they do not have it, return to Lithuania, and still not change anything. However, at least one knows it is different elsewhere.* (36-NG-LT)

In further discussion, it becomes apparent that the approach, as intended by S3, is not institutionalised yet in Lithuania. The interviewee quoted below speaks about differences between continuity in Scandinavian countries and opposes Lithuania's ad hoc processes. Finally, *the mentality* serves as an explanation, implying that not all relevant stakeholders perceive the approach as a natural and unquestionable mode of action. Besides, the interviewee is also aware that other countries and regions went a long way up to their current state of affairs (Lithuania is now where these countries were roughly 50 years ago):

> *When talking to those progressive countries, they also said something was going on: 50 years ago, they were like that too, and now they work entirely differently. The Scandinavians spend much time on the discussion. They go into details and specify everything. The discussion starts not when one needs to programme but much earlier. They get it ready at once. What is Lithuania doing? Lithuania gets it ready, quickly runs forwards, does it once again, remakes, in the sense that there is still no ability and culture to sit together, talk, discuss, decide, agree, and move in a common direction. I say, same as our business and even large entrepreneurs say, it is the mentality.* (26-NG-LT)

Thus, to imitate complex processes, the ability to recognise "same wine in the new bottles" and a sufficient level of absorptive capacity may be necessary to benefit from the experiences. Proximity

to and cooperation with well-developed innovation systems may enhance learning, otherwise decoupling may occur, even if it has not been intended.

An interesting observation might also be done based on the quote below. Thus, it could be assumed that even though mimetic isomorphism "works" and solutions are copied, it is the "wrong" type of actor who takes the initiative and attempts to implement good practice, initially developed by a different type of actor. In such a case, the government sector attempts to fulfil what might be considered the domain of private actors (business):

> *I do not even know if it is a problem: the state takes over the private sector's function with substantial funds. Various accelerators are made, all kinds of programmes, which are business functions. These are science and technology parks, and private venture capital investments do this. Now government organisations come with the Structural Funds and are doing the same. Therefore, the whole private sector, how can they do it. In my opinion, the state takes on business functions and slightly distorts the market with much money.* (35-BS-LT)

Concerning the issues elaborated in the quote above and recalling the discussion on stakeholders' roles earlier in this thesis, an obstacle to institutionalising initial assumptions of S3 might emerge. Thus, policy-makers (or other stakeholders) attempt to compensate for the roles that others, e.g., business, cannot fulfil. Regardless of why not, the balance of influence might be skewed towards some sectors (e.g., government). When the emergence of, e.g., clusters or research infrastructures, is enforced with public funding but not based upon existing demand or self-recognised needs of the business sector, these organisations might not sustain their activity without public support. Therefore, it might be helpful to investigate whether the more substantial involvement of such organisations in EDP and S3 stimulates innovation activity in a broad business sector. Alternatively, maybe it might strengthen the government sector's capacity for innovation and increase its share in GERD, with possibly little impact on BERD. These questions remain subject to further research.

The quote below illustrates mimetic influence through media and the emergence of trendsetting themes in broader society in Lithuania. Thus, in 2013, MOSTA conducted six surveys for the purpose of developing S3 priorities (one for each specialisation domain), intending to collect information from a broad range of actors representing science, business, and the public sector (STRATA, n.d.-a). According to the interviewee, people filling in the survey tended to choose themes set in the current discourse in politics or media.

> *The survey actualised some questions. Well, the survey was very broad. All three poles were there: business, science, and government if I remember correctly. People asked to identify some problematic points*, [pointed out] *what is in the press, in the media. At that time, it was the drinking, the black statistics, and these things immediately came out. Well, we included it.* (27-S-LT)

The quote above mentions including drinking into priorities because it came up in the survey as a challenge for Lithuania. However, the interviewee also mentioned that it does not necessarily imply that the issue might be resolved with the extant potential for innovation.

5.4.2.3. Normative isomorphic pressures

Because S3 has been introduced as a tailor-made approach, expected to fit the regional context, the guidelines provided by the EC (as RIS3 Guide) have been rather vague. They indicated what steps to take and possible aspects to deal with but left considerable freedom for the regions to decide upon the design and implementation of these steps. Hence, standardisation at the European level could be perceived as weak. Consequently, in Lithuania, some stakeholders felt a lack of guidance.

In Lithuania, previous experience with regional innovation strategies has been lacking. Therefore, many stakeholders perceived S3 as the first exercise of this type. Hence, the country lacked an approach, which could be at least partly presented as EDP. Therefore, more detailed guidelines would have been welcomed, as becomes apparent in the selected quotes below:

> *When the process started in Lithuania, there were no guidelines. Everything went in parallel because the Commission said that priorities would be needed. They were preparing guidelines, and there was not much to rely on. It was just the idea itself and maybe such snippets. We knew it had to be that entrepreneurial discovery, that it had to be sought not of doing the same, but of new ideas, and that communities had to be involved. Such general guidelines are very abstract, but there was no procedure to say for how long someone has to get involved, what methods, should it be, benchmarking or such details. There were no methodological guidelines, and we had to create them ourselves. That is what we did.* (22-F-LT)

> *The Commission has been late enough to give birth to those guidelines. Because they have to be, in the sense that if there are rules for it to be constant, there has to be supervision, monitoring, and evaluation. One has to write that process straight away, not in general phrases*. (26-NG-LT)

As the quote below demonstrates, normative influence and common standards may not be beneficial and inhibit the development of individualised and tailor-made approaches. Besides, standardisation emerges when a formal body exists, setting and spreading common standards.

> *For all 14-20 activities, there is a standardised application form submitted through an electronic system for all support measures. There is unification on the side of documents, and evaluation criteria are common to the whole programme. Of course, what aspects to look at depends on support measures and a project, but that standard is under development more and more. It goes on probably from 2004-2006 and is increasingly sought to unify, which is not necessarily good. Because of projects' variety, one needs to bring some aspects to the surface in one case and others elsewhere. Thus, it is not best for everything if there is one template. It is such an average. We cannot enter additional criteria. The Steering Committee decides, for each measure, what the general or specific selection and prioritising criteria are. The Steering Committee includes both the social partners and the ministries' representatives. We can offer some additional attachments or documents and forms to them so that the information is provided and there is no need to make five requests. On that side, there is an opportunity for the agencies to offer* [their feedback]. (31-NG-LT)

When requirements are nebulous, but policy-makers have to develop rules and procedures that would ensure implementation of the approach, the modification mechanism becomes active. Policy-makers try to make sense out of requirements and decide how to proceed. When the decision is to develop a new methodological approach, the professional background of people in charge and their experience might play a significant role, as shown in the quote below:

> *The idea came from the bottom of the discussion. Only two alternatives were actually considered. "As always" means analysing the other countries' priorities in a couple of months and just gathering some people who decide. It was usual here, and the second* [alternative] *was to develop a new process based on foresight and data. It just happened that there were people who, when the question arose, just had a perhaps broader perspective and some knowledge: studying foresight, completed training and certification, wrote in MOSTA. Some people just knew what it was. Hence, the suggestion came out of this.* (22-F-LT)

Therefore, personal experiences/professions might influence the decision and design of the process or the documents. In the quote above, a reason for choosing the foresight approach is people who knew the methods and could relate their knowledge to the context of S3. Therefore, either doing the same thing or doing something new (which needs some basic knowledge of how the "new" approach could be implemented).

When S3 started in Lithuania, a lack of professionalisation and established norms could be observed at the coordinating level, responsible for connecting distinct steps of the strategy process. The quote below reflects the difficulties that vague guidelines caused for the alignment of S3 with the structural funds:

> *Still, one should have some general template: how it looks, what is monitoring, evaluation, what instrument and how to use, etc. Naturally, one cannot release the money and funds because if something comes into the system, it automatically has to come together, encode. Otherwise, everything is delayed. It was impossible to adapt to the process set up by the working groups and the roadmaps to the structural funds because we have the "n + 3" rule. These are regulatory matters. It just has its subtleties. Because what does it mean to evaluate whether it satisfies* [the criterion of smart specialisation]*? What has to be loaded into the system? All the rules, the checklists, to have a system that works and analytics that can be pulled out. This load to the system was considerable because of S3. If there were immediate guidelines from the Commission, it would be simpler. However, there were not. Then we thought about how realistically, having only a selection criterion, base all the analytics, supervision, evaluation on it so that STRATA would have "meat", as we say, from which to conclude. That had to be done.* (26-NG-LT)

Thus, policy-makers were overwhelmed by the results of EDP presented by the working groups. It was unclear how the EDP outcome fits with the extant structural funds' system and its rules. For example, the *n+3* rule mentioned in the quote requires spending money within a specific time frame after contracting, which collided with the demands of specific priorities specified in the roadmaps. Also, even though S3 might look simple (being "just" an additional criterion for the authorities

responsible for the distribution of structural funding), there are still significant challenges as the data are needed for different purposes further in the process (e.g., monitoring and evaluation). Therefore, procedures had to be built, and standards for collecting and managing the data related to the fulfilment of the criterion established.

Regarding the emergence of specific standards through mutual learning (e.g., during Interreg programmes), the level of policy application and degree of detail should be considered. When demarcating monitoring standards (e.g., what types of data might be used), it might be challenging to implement:

> *In Interreg, they work at quite different levels because, e.g., Lithuania is treated as one region. We act at the national level. However, many countries have separate regions and sometimes even small regions, including municipalities. They take part in Interreg as separate regions. Therefore, that weight, size, and level can vary substantially. It is difficult to say that we can now use the same* [types of] *data. Because that data collection is different and varies whether it is a municipal, district or national level, it may not be the case in this situation.* (33-NG-LT)

Thus, different policy application levels could hinder, to some extent, the emergence of common standards among participants in the international learning workshops (e.g., when considering monitoring approaches, some data may be not practicable to collect at a certain territorial level). Across the EU, S3 is defined at different levels: regional and national (NUTS2 and NUTS1). It might also be desirable to conduct EDP at even lower levels to ensure better participation at the bottom. Therefore, standards would need to emerge at the appropriate levels. Also, information flow downwards and upwards could play a paramount role in the system's functioning. Perhaps a more accurate implication would be that an interconnected web of standards needs to emerge.

5.4.2.4. Summary

Table 57 summarises the outcomes of isomorphic pressures in Lithuania.

Table 57 – Summary: Outcomes of isomorphic pressures in Lithuania

Isomorphism	Findings
Coercive	- Official documentation as proof of compliance; - Stakeholder involvement has been challenging and discontinuous considering the six steps approach, which might subsequently connect to a lack of sectoral leadership;
Mimetic	- Region's similarity may affect learning outcomes: learning from "similar" regions is more straightforward than from the more advanced because of the necessary institutional, economic or cultural conditions that support knowledge transfer; - Actors from a specific stakeholder group may copy solutions initially developed by a different stakeholder group (mimetic isomorphism crosses the border between helices); - Trends affect different stakeholder groups; therefore, broad stakeholder involvement

	might also result in duplication of priority labels and does not automatically lead to exploitation of extant potential;
Normative	- S3 guidelines were not precise or detailed enough to ensure standardisation, which resulted in custom development of standards, affected by, e.g., the actor's professional background; - Emerging standardisation and professionalisation concentrates on selected EDP aspects (e.g., project selection or monitoring) while the holistic view and connection between elements remains unattended; - Different territorial policy application levels might require distinct standards so that some approaches could be not transferable, e.g., between national and regional levels (thus, separate standards may emerge for each of those levels);

Source: own elaboration

5.4.3. Poland

5.4.3.1. Coercive isomorphic pressures

Despite the impression that business involvement in Poland has been better than in Lithuania, the factual evidence may does reflect this unambiguously. Thus, the influence from different groups might have been less balanced than it initially appeared. In the quote below, an interviewee points out technology foresight as an exercise characterised by substantial business involvement.

> *The most significant involvement of enterprises was at the stage of technological foresight. There is a kind of document which serves as input. It was an extensive study of companies. When preparing national smart specialisation, information was collected on enterprises' activities, for example, supported by European Funds.* (3-NG-PL)

However, a look at actual numbers, available in the official reports from the foresight exercises *InSight 2030*, reveals academia's dominance and relatively low business participation, ranging from 4% to 6%, depending on the stage (Polish Chamber of Commerce for High Technology, 2011a).

An example of how documentation may help legitimatise decisions might also provide the case of Śląskie. Many reports and documents describe Śląskie's strategies, EDP, and monitoring mechanisms. These documents all together provide a large amount of information and make up a solid façade of progress. However, examining the described EDP stages renders no unambiguous evidence that firms were actively engaged in selecting priorities. The description of the EDP procedure as provided in the document *Badanie ewaluacyjne pt. "Process przedsiębiorczego odkrywania w kontekście rozwoju innowacyjnego województwa śląskiego do roku 2020"* implies that S3 areas have been selected based on extensive statistical analyses. These included calculations of the location coefficient and regional competitive advantage within specific PKDs combined with patent applications compared to the national average, and technology advantage, scientific projects,

and potential at the crossroads of these potentials, among other tools. So, in Śląskie, analyses revealed:

> *In light of the analysis conducted at the 4-digit code level (PKD), the Śląskie Voivodeship has a very wide range of technological advantages in areas related to emerging industries and the green economy. The technological advantages of the Śląskie Voivodeship almost entirely cover the list of sectors of emerging industries and the green economy.* (own translation, UMWS, 2017, p. 95)

Experts verified the results of these analyses and the selection of smart specialisations. The entrepreneurs have served as information suppliers (second phase of EDP) to the policy-makers regarding their needs (e.g., identified barriers to innovation). Thus, *emerging industries* and *the green economy* have been approved as smart specialisations of the region. *Emerging industries* contain distinct areas, such as eco-industries, maritime, creative, mobility and mobile services, and personalised medicine. Hence, EDP justifies introducing additional specialisation with very different domains and, consequently, possible attempts to diffuse support, which may be against the consolidation principle.

From the description provided in the official documents, it appears that policy-makers have taken the instrumental perspective as specified in the findings of Eckerd and Heidelberg (2020). However, a somewhat more participative perspective may be seen in the smart lab approach, adopted to search for business-science cooperation opportunities in the field of the circular economy. The exercise connected to the "new" green economy specialisation and exploited synergies with corresponding national smart specialisation.

The three examples from Poland, discussed in the subsection on governance structures and their sectoral component, might illuminate the role of leadership and its different aspects for the success of S3. Thus, one region has often been cited as an excellent example of EDP, as it took the original approach and defined specialisations in a genuinely bottom-up process. As becomes evident, such an approach has been possible because of previous policy initiatives and especially experience with the cluster policy. However, even when stakeholders had defined priorities, it came to the point where the same stakeholders did not know what to do next. Also, another example showed that working groups had downsized their work intensity after priorities had been defined. As in the case of the third region, the leadership could also stem from the established entities in charge of specific specialisations.

Thus, S3 might need leadership based upon understanding a specific domain. Therefore, a sectoral governance component, which can ensure leadership, is essential for advancing priorities. Extant intermediaries can also successfully conduct this role as an alternative to appointing leaders within specialisations. Specialised entities mentioned in one of the discussed cases of Polish regions (in the subsection on the sectoral governance component) are such an example. Clusters could also be among potential leaders. Experience of several Polish regions shows that specialisations with more robust clusters have less risk of stagnating. In the words of an interviewee (7-RG-PL): *"clusters organise specialisations"*. However, in the financial programming perspective 2014-2020, S3 was in focus and clusters were somewhat neglected (despite the reference to clusters in the RIS3 Guide).

5.4.3.2. Mimetic isomorphic pressures between Polish regions

Time pressure and encouraging finding an own path for EDP impeded mimetic isomorphic pressures at the initial stage. As a result, regions concentrated on presenting their approaches as suitable instead of searching for best practices, which often were difficult to recognise. Notably, some regions could build on favourable conditions developed during the past approaches while implementing similar policies. It allowed such regions to serve as prominent examples of good practices, while others struggled with the approach. The primary platform for experience sharing among Polish regions has been Regional Smart Specialisation Forum, established as a regional initiative. Hence, various regions in Poland approached S3 as a continuation of the developments introduced with previous strategic documents. They relied on practices that have been successful in the past and appeared congruent with EDP. Quotes from interviewees may serve as typical examples here:

> *However, in the regions, it hatched a bit worse. In our country, perhaps the most advanced region in these works was* [name of the region] *because they had the most significant experience of implementing foresight projects. For them, it was such a natural transition to this, and it was not a great difficulty.* (2-BS-PL)

The quotes below reflect that Polish regions' smart specialisations resulted from previously adopted documents or became their parts. Thus, the first and second quotes show how S3 was a natural continuation of previous approaches:

> *It was such an ongoing process, although the specialisations were only introduced around 2009. It started in the EU because smart specialisations respond to the needs of regions to develop potential. Therefore, an orientation in* [name of the region] *already existed in the first regional strategy, in force since* [year]. *Smart specialisations of* [name of the region] *arise from such a division of the development directions of this region, which runs in two ways. There is a distinguished technological development, and the other direction is typically innovative related to the development of such innovative entrepreneurship. Precisely outlined directions of technological development have been selected from*

> *these. There are eight technological areas, and smart specialisations have been isolated in a bottom-up manner from them. The first* [names of specialisations]*, and in* [year]*, resulting from EDP, S3 was expanded to include* [names of specialisations]. (9-RG-PL)

Alike the quote above, the following quote also elaborates on how the current approach to S3 naturally resulted from the previous innovation policy, but differently:

> *We took over such a process. Because* [previous] *strategy was in force for a long time, until 2014 meanwhile, other documents were prepared, including the Regional Cluster Support Programme for* [name of the region]*, established in* [year]. *Based on this programme, we announced two competitions for Regional Key Clusters. It is important because we started shaping the policy, which we consistently continue to this day. We do not have a separate document, but our Innovation Strategy is included in the Regional Strategic Economic Development Programme. It results from all the activities that took place before. These issues relate to clusters because the current innovation strategy specifies, among other things, the policy towards S3. Poland seems to have split into two different trends. Some hired competent experts, prepared documents with various analyses of industries with the most significant development potential, and chose smart specialisations on that basis. On the other side is the other half, including the [name of the region], the leader in the most bottom-up EDP. We did not imagine doing it otherwise, as announcing the competition. Just like we did with the Regional Key Clusters. We have such a database of expert documentation and know our strengths. We have* [a unique location]*, the ICT cluster, the furniture, the healthcare, and universities. However, it makes little sense unless some people and partners will be active around these areas. That is why the competition caused these partnerships to intensify, create groups, consortia and start talking about joint projects, initiatives etc.* (7-RG-PL)

Similar to the above, the following quote explains how policy-makers started developing an innovation system approach and prepared the first strategic documents before introducing S3. Thus, policy-makers attempt to stay on the chosen path and incorporate S3 into the current strategy:

> *Our first RIS was adopted in 2008, with the date from 2007 to 2015, and it was quite a new document. We started working* [on S3] *in 2012, which is in half of the implementation* [of the strategy in force]. *We wondered how to address it because the third generation of RISs, i.e. S3, completely changed the approach.* [We decided] *to update these regional innovation strategies, review them a little, rewrite some issues, update the diagnosis, these elements, and treat smart specialisation as something to concentrate an action, but not as an end. We treated S3 as something, which shows that the goals set in the Regional Innovation Strategy, the main document, will bring the most remarkable effects for the entire economy when achieved within smart specialisations. Thus,* [we treated S3] *as a tool to increase efficiency. Therefore, S3 was placed in the annexe to the Regional Innovation Strategy. We have goals related to the regional innovation system and S3, which specifies that the concentration of activities in these areas will bring the greatest effects. In terms of R&D results, as used in the EU, and construct a regional innovation system in these areas.* (6-RG-PL)

Compared to the previous quotes, among the reasons for staying with the current strategy is also mentioned that at the time of introducing S3, it was still too recent to show effects. It has been the first innovation strategy of the RIS type in the region, and the innovation system was still underdeveloped. Thus, a coercive pressure to develop S3 resulted in incorporating S3 into the current strategy as an annexe. A similar challenge could also be noticed in another region, where the actual RIS was also adopted just shortly before the requirement to start EDP for S3 emerged.

The examples of establishing a monitoring system and the inter-regional cooperation initiatives, discussed in the quotes below, demonstrate how learning is still in process and practices and procedures are under development:

> *We have several studies, the document monitoring system, i.e. indicators. We have cyclical qualitative research from time to time. However, it does not make much sense to conduct it too often. Next year, we will also probably be doing a quantitative component. There is a particular mode in which we work cyclically, slowly bringing some effects. However, not that one or two evaluations are done, and we are talking about the system. We have certain knowledge, which we collect and improve. We are probably one of the provinces that do it reasonably. We often serve as an example. The way we have developed for ourselves works to provide us with knowledge. However, we also see its imperfections, and each study is being improved, addressing identified deficiencies.* (10-RG-PL)

The interviewee tells about different quantitative and qualitative approaches used in the evaluation. However, these are not seen as a complete system yet, but as separate evaluations. Instead of the system, the interviewee refers to the collected knowledge that enhances learning. The quote above also reveals some uncertainty. On the one hand, the way the region proceeds may serve as an example to others. On the other hand, the interviewee admits that the system is incomplete, and some deficits need improvement. A similar pattern emerges in the following quote, addressing regional cooperation. The interviewee mentions cooperation initiatives between stakeholders when there is a common specialisation, e.g., food. However, these initiatives are not very extensive or frequent. On the other hand, in connection to S3, it appears that experience sharing between regions is getting common.

> *There are different initiatives, with* [names of two regions]. *One cannot say these are often or that regions always collaborate on their shared specialisations, but various initiatives exist. Companies will always cooperate if they have such a need, but local governments also cooperate. On the other hand, regions generally cooperate in specialisation, inter alias, through a group created by voivodeships. It is called the Regional Smart specialisation Forum. We meet, share experiences, talk about how the processes are. We do not necessarily talk about specific sectors but only about processes in the regions, stakeholders' involvement. We talk about EU projects we participate in, what we struggle with, how to monitor. We also cooperate as 16 provinces, quite strictly. As a good example from the country, I would suggest* [name of the region] *because this process was very inspiring from the very beginning. What we are doing now worked a bit earlier there, only based on clusters. It was an inspiring example.* (8-RG-PL)

From the quotes above, it becomes evident that the regularity of specific practices or initiatives and continuity in repeating some procedures determine whether the learning process might be perceived as completed and approaches institutionalised. Incomplete learning implies that the institutionalisation process is not exhaustive yet. It means that there may be already practices accepted and used, but those are not embedded in the everyday routines. Imperfections may be noticed and improved. Indications of incomplete learning could be observed in Poland's regions, relating to different aspects of S3. In the process of learning by imitation, modifications may take place. Hence, there is a risk that developments may go in a different direction than intended. The

reasoning behind incomplete learning is that the experiences of others are perceived as inspirations but not recognised as the best practices yet.

Still, it needs some time for the regularity to be observed, and it appears that it has still been too short concerning some regions or specific practices. Therefore, including the need to pursue continuous EDP as an eligibility condition in the financial programming perspective 2021-2027 might be the right step to sustain the learning process.

However, mimetic learning might also favour disseminating the ideas and practices, which are not necessarily congruent with initial S3 assumptions. Initially, many regions in Poland have chosen numerous specialisations and defined them broadly. With a limited number of specialisations, one region has been an exception. However, later two horizontal specialisations were added. The quote below argues for such a choice by pointing out that such practice is typical in other regions:

> *Of course, they* [specialisations] *are* [defined broader than in the initial version]. *If one considers what other smart specialisations look like in Polish regions, few regions had only three narrow specialisations. Narrow in the sense that there are also specialisations such as, for example, "Healthy Society". It is a very broad specialisation. On the other hand, the region is before transforming from such an industrial region into a region more based on modern technologies and services. It is because we are slowly leaving the heavy industry.* (9-RG-PL)

Therefore, the region has adjusted to the common practice, and the former choice characterised it as an outlier. Afterwards comes the argument that mature industry dominates in the region and needs transformation. Even though the quote does not mention this explicitly, a possible reason could be that the region is unsure about the desired transformation's direction. Also, traces of mimetic isomorphism may be noticed, working in the direction divergent from the initial S3 assumptions. The region has defined specific specialisations, but after seeing that others came up with broader and less substantial results, it has changed its priorities. Because of many examples with broad specialisation labels, monitoring rising trends within broadly defined specialisations and trying out different things in the region appears as an appropriate search path.

Lack of critical mass within specialisations might also be the case in Polish regions, resembling the Lithuanian example. Thus, monitoring reports in a region identified that in some areas selected as priorities of S3, very few or even no firms could be found. Hence, the criterion of critical mass has not been fulfilled. The quote below indicates that these have been included based on current trends in the country and globally:

> *In discussions with entrepreneurs and scientists, we recognised that these areas might develop with public money and support. Because we also looked at certain trends that characterise the Polish and global*

> *economies. These trends are noticeable to everyone who deals with this topic. We recognised that these sub-areas within smart specialisations have a chance for development in* [name of the region] *because of the scientific community and entrepreneurs in these areas. With some support, they have a chance of developing. However, unfortunately, it did not happen that way, and this is also a lesson in monitoring and implementing S3. So now we should conclude that maybe the areas that fit into these mega social trends, mega economic trends, despite our efforts, for some reasons in* [name of the region] *will not develop and are not developing. They should be removed from this directory.* (11-RG-PL)

As already discussed, labels given to specialisations might be broad and appear alike because of mimetic influences while following trends. However, as indicated by interviewees, the label alone does not necessarily determine what will be implemented. Therefore, differences between the regions within the same country regarding the content call for different approaches to implementation and imply different results to be achieved. The quote below reflects the broadly defined specialisation, in this case, based on a goal: e.g., to achieve a high quality of life:

> *It is not a specialisation. It is the goal to improve the quality of life. Each region is different, has a different level of development, the structure of its economy is different. The level of income is different. Therefore, the goal entitled "Improving the quality of life" should be achieved differently in each region, which must be defined. It cannot be a specialisation in improving the quality of life. Thus, improving life quality in the Białystok region would be based on something different from improving the quality of life in Poznań and Wielkopolskie. We need to know what this means at the level of Poland and what it means at the regional level. For example, we say that improving the quality of life means creating conditions for people 60+ or 65+. If they want, they can return to the labour market. However, there is a need to ensure that they are healthy. Now the question is how to achieve living healthy for people. Well, all of them, of course. However, here we have the goal of 60+, taking advantage of their knowledge, skills, intellectual capital, and human capital.* (15-BS-PL)

Thus, defining priorities as goals rather than specialisations still requires different actions to achieve these goals. Therefore, instead of priority labels, mimetic influences should affect concrete actions to implement the selected goals. The hypothetical example above shows how considering specific measures and actions might integrate efforts and achieve genuine prioritisation despite broad and imprecise priorities. One of the crucial elements is to define the primary target group (in the provided example, people aged 60+). Afterwards, one could consider the implications of the selected goal for the target audience (e.g., participation in societal life through the possibility of staying in the labour market). Finally, policy-makers could determine the barriers that innovative solutions could eliminate (e.g., education regarding specific aspects, such as nutrition, fitness, and upgrading skills). Therefore, a possible priority for related-variety-based diversification could be to develop educational solutions for older adults, provided that a region has scientific and business potential in developing education solutions. The potential could include IT, psychology, medicine, or sports science, among other fields.

5.4.3.3. Mimetic isomorphic pressures at the international level

Interviewees in Poland often could remember regions for inspiration if they have been there and could learn about some practices. Another issue concerning mimetic isomorphism is a region's ability to learn. The quote below outlines how previous learning experience and contacts with peers helped to increase absorptive capacity for S3 and EDP:

> *In the early beginning, we implemented such a project called "TRES". It was also a partnership that resulted in learning the EDP. This project helped us a lot to get involved in updating the strategy. We had the opportunity to meet more developed regions, such as the Basque Country, and maintain contact and cooperation, showing* [us] *how and what approach, models* [to apply] *and* [where] *attention should be paid. It was one of the projects, and it was a win for our region. Hence, it may be easy to enter the EDP later, cooperation with the S3 platform and these guidelines were not a puzzle for our region.* (13-RG-PL)

The ability to recognise "best practices", consciously analyse them and apply them to own context can be considered another critical quality of the learning process. As the quote below illustrates, there are no "best practices" relevant to S3 and unambiguously recognised as such yet. Instead, the interviewee speaks about individual experiences and inspiring examples:

> *It still seems that this is the first such period when we have it so formalised, although it was also earlier. These regions are very diverse in innovation levels and the system, as the applied solutions were. For example, there were economic observatories already before in* [name of a region]. *It was worked on it, and the name means everyone has such a structure. They have an idea about it. Well, one had to build a structure. In* [name of a region], *they have such specific specialisations related to the* [specific asset], *and there were works carried out, contracts, and platforms. To say: "yes, it is our good practice, they did it, and it worked great for us" I guess no one would say that because it is still a process that needs leading and modifying. I do not know if it is possible to say that it is the best practice. It looks that it will be such inspirations instead. I guess it will not be a recipe for a cake, doing this and that we will have such a cake. It will not be possible. There are several components in each region, the dough is different, and there are different ingredients.* (5-NG-PL)

The interviewee also reflected on the difficulty in transferring practices because of the regional specificity, as the following quote exemplifies. The quote refers to the regional specificity as a barrier for applying ready-made solutions from other regions:

> *It was in the form of such panels and discussions and presenting good practices. There was also an exhibition part. So, we could listen to the problems and other regions' cool ideas. However, this is not always applicable because each region has its specificity. There is also a different level of social trust in each of these countries. One can learn a lot about how it is resolved, but it seems that it is still impossible to apply these solutions because everyone is discovering so far, learns. There is no such manual yet that one has to do it, and it will be. No, everyone tells what worked for him and what did not.* (5-NG-PL)

The quote above also indicates that regional specificity justifies the development of customised solutions. Other interviewees also support such a view. In line with the quote above, another interviewee elaborates that it is not enough to look at foreign experiences. It might also be essential to adapt it to the national context for the acceptance reasons:

> *It is worth observing how other countries approach it. However, I believe it must be adapted to our conditions. One has to consider how they do it in other countries and see which solutions used in other countries could fit our conditions. If it turned out that none, then think about what one could use and what to add, considering Poland's specificity. Otherwise, it will not be accepted.* (15-BS-PL)

Thus, concerning good practices, the difference for the region might be whether one can make sense of how to implement them in the respective regional context, as outlined in the quote below:

> *Regarding good practices, the OECD report and now the one we are writing, ending with the periodic evaluation of the RIS, are two sets of good practices and their potential use. We are now looking at these good practices from both reports that we can implement. However, while the OECD did it, they looked altogether, showing us what it looks like. Of course, it is an excellent value for us. While in the evaluation, the evaluator's task, apart from identifying good practices in implementing specialisation, was to show the way toward their implementation in our region. For example, what needs to be changed, which institution to improve, reformulate, or any processes. There is a good practice, but it is also* [important] *to show how it can be implemented in our region and its effects. So this is all a challenge for the following year.* (10-RG-PL)

The following quotes indicate that mimetic isomorphism might also be the case of intuitive and unintended learning rather than conscious analysis and choices of best practices that would suit the region:

> *We are learning from others all the time. Therefore, it is difficult to say that this particular initiative contributed to whether or not we would learn more. We keep an eye on what is happening in Europe and the world. Thus, one element is simply this area related to S3 at the European level.* (9-RG-PL)

> *Indeed, when developing the strategy monitoring system, then the innovation strategy, we used patterns from, probably, Austria, Vienna. It is hard to say that we would now, for example, implement some good practices in such a way entirely. Probably not. Apart from, for sure, Lower Austria, Vienna* (8-RG-PL)

Reflections from the various quotes above indicate that transfer may be successful when institutional proximity exists, implying that it is possible to implement the solution in the own context.

Several interviews reveal that transfer of practices from advanced innovation systems might demand some "carriers" of relevant institutions or tacit knowledge that increase the relevant helices' absorptive capacity. A vivid illustration could serve the cluster in one of the Polish regions. As illustrated in the quote below, strong leadership in the business sector has been built based on external knowledge and resources (USA). Firms had a foreign origin and had been funded from abroad. However, they had also found partners in the region (local government and universities) when they needed:

> *The* [name of the cluster] *cluster was established in 2003 if I am not mistaken. It was a cluster made up of businesses that generally came from American corporations, and it was an American pattern. Too,* [name of the cluster] *got money from American corporations to establish the cluster. However, they had a leader. There was activity. The* [name of the cluster] *was also an excellent partner for the regional authorities. We carried out a large project together to implement the Innovation Strategy, the previous one. The* [name

> of the cluster] *had its budget for this project. A part of this project were also universities in* [name of the city]. *Also, the* [name of the HEI] *had carried out a task over several years - "Support for clusters and cluster initiatives". So we have the* [name of the cluster] *as a developed cluster. However, before S3 was created, there was a decision to support cluster structures and identify specific cluster initiatives. That was where money was directed under the project, the systemic one.* (12-RG-PL)

Thus, the positive experience with the cluster mentioned above and support for cluster initiatives determined the region's approach to S3. Therefore, the region aimed to base specialisations on clusters to ensure a platform for contacts between public authorities and entrepreneurs. However, the example of a broadly defined specialisation in the same region shows it might be difficult to transfer the approach because the specialisation is composed of multiple areas that are not connected by coupling structure in the business community, as the following quote indicates:

> *The [name of the cluster] cluster was created at the time of the strategy development. However, the "Quality of life" is like a conglomerate of several areas, several industries. For example, one of these areas is "Climate and Energy". Here we have the* [name of the cluster]*, the heads of this cluster are at the* [name of the HEI]*. There is, for example, the* [name of the cluster] *at the* [name of the association] *in* [the area of] *"Health, Food, Nutrition". The* [name of the cluster]*, the* [name of the cluster]*, the "Health Cluster" at the* [name of the HEI]*. There are also tourism clusters. Also, it is not one* [name] *cluster. That was the idea in 2013-2014. However, one organization cannot cover all those areas of the* [name] *specialisation. There are many of these entities. We treat it as separate entities, these clusters.* (12-RG-PL)

Broadly defined specialisations, e.g., *healthy society, quality of life, green energy, emerging industries* do not have an organically developed cluster because it encompasses many diverse areas (not necessarily related). Hence, leadership might be harder to achieve, and the local authorities should coordinate more to compensate for it.

When considering mimetic isomorphic pressures, it is essential to regard different aspects, including policy practices and the name of priorities and their content. Because of global trends or themes in the EU, regions may still follow these trends and choose the "same" priorities concerning the labels. The quote below elaborates on why priority labels are often similar:

> *At least in Poland, and probably also in many other countries, there is difficulty showing what is specific in a region. If one analyses several strategies simultaneously, some topics in these smart specialisations are generic. Half of Poland has an eco-: eco-construction, eco-innovation, eco-investment, trying to make eco-something a specialisation. The question is whether each region can objectively create some real competitive advantage in this eco-. I am afraid that not. So why this eco- gets there? It came from what we were talking about at the very beginning. In formulating policy, there are also some fashions, trends, a top-down message from the EC, as there is "Industrial Transformation 4.0", globalisation, and a "Green Deal". Now we have COVID. Those who are recipients of these messages and impact decisions, what do they want to do? One has to fit in, to adapt, right? So I am convinced that with the renewal of RIS, half of the regions will have something that will refer to COVID. Thus, everyone will want to specialise in IT solutions to counter a pandemic, medical solutions or testing, because it is a hot topic. So everyone is trying, and everyone knows that some public funds will be allocated to it. In connection with that, we have a lot of such examples.* (16-BS-PL)

The quote below makes it even more clear how isomorphic pressures might act in different directions. On the one hand, there are coercive pressures to base S3 upon individual strengths. On the other hand, the trends emerging in the global environment generate mimetic pressures to follow them, as the following quote asserts:

> *For sure, there is a question of fashion. Well, it is like thinking about smart specialisations at all. It assumes a bit to see what one has, and on the other hand, how our environment is developing. It is a bit of a prediction of what will be important in the future and a reference to what we have and what we may have in the future and choose what we can do. Thus, if we see some world trends, it is difficult not to follow them. So it is indeed this aspect.* (20-F-PL)

The quote above also refers to predicting the future in connection to world trends. Predictions are essentially uncertain. Therefore, following the trends could support the legitimacy of the decision-making process while demonstrating to the stakeholders that prospective topics are being chosen and coined in priority labels. However, to gain a complete picture, one should also know what these labels imply for strategy implementation. It might have implications for the cooperation between regions, as illustrated in the quote below:

> *Smart specialisations sometimes have a very similar or the same name. However, in the middle of this specialisation, if we think about technologies, a group of enterprises, and a group of science that creates this smart specialisation in a particular area, regardless of whether it is a country or a region, it will always be something else. Why am I talking about this? For example, we have a cooperation with France, with the Lower Loire region. We have been developing it for two years, in an INTERREG project. We are building an inter-regional cosmetology programme. Of course, when we first researched our regions, it was about bio-economy and bio-resources. We had much overlap, but when we got down to the more critical details, it turned out that we are really characterised by something else. We had to look for these shared connections within smart specialisations. This example is also a reflection of many regions in Poland and Europe.* (13-RG-PL)

Chasing trends and choosing similar labels for the specialisation might make it challenging to identify potential partner regions based solely on studying priority names. Thus, elaborated analysis and mapping of the sectoral and technological innovation systems become essential for identifying connections and knowledge flows. As already mentioned in the first quote in this subchapter, not every region that chooses a specific label, e.g., eco-, might have the potential to advance such specialisation on its own (16-BS-PL). Therefore, particular specialisations may not thrive in some regions, even if the local resource base supports them, connecting to the priority boundaries defined by an innovation system's sectoral and technology aspects. Therefore, exploiting collaboration potential could have mutual benefits for the regions, as explained in the quote below:

> *However, Poland's regions' level may not be the most appropriate for smart specialisations. Perhaps there is no reason to think that, e.g., Lubuskie or Lublin voivodeships will have their smart specialisations in something more advanced. Maybe half of Poland should have some specialisation, or it is more critical at the Polish level. For example - this is probably a good example - with the aviation industry in Podkarpackie. Suppose one looks at where they get their knowledge and ideas. In that case, it turns out that, except that they are also internationalised and draw from abroad, their primary source is not the*

> *Rzeszów University of Technology and the University of Rzeszów, but the Warsaw University of Technology because here is a great aviation department and so on. So it makes no sense to treat these two entities separately, separating them artificially. So there are probably some specialisations that can be regionally close.* (20-F-PL)

Another aspect concerns learning curves in the separate helices and development of innovation systems. In Poland (same as in Lithuania), failing to copy specific structures, considered an integral part of innovation systems or ecosystems, can be observed. Public funds often support the emergence of initiatives, e.g., clusters, incubators, accelerators, which make up business support infrastructure. However, their effectiveness is often limited, as noted by different experts in Poland and Lithuania. The quote below elaborates on the problem of scattering funds and establishing many initiatives, despite lacking demand:

> *In Poland, it is simple to capture the relationship between the formation of certain initiatives and public funds. If the state allocates public funds to specific goals, initiatives immediately arise, often even artificial, to absorb these funds. I can provide plenty of examples, and these are technology or industrial parks. All analyses indicated a potential for four, five, maybe six large technology parks in Poland, such as science and technology parks. However, for political reasons, 30 initiatives have been launched. Later there were 50. Half of them do not exist anymore. Nobody remembers these names. However, when public money appeared, it arose immediately. When PARP financed the creation of such investment micro-funds, such mini-accelerators, again in the analyses, it came out that such accelerators should be established at the largest universities that have their parks and technology incubators, and then there were 50 initiatives. It is such a natural relationship. If the state communicates that there will be money for something, everyone potentially says that we need to create a slogan to apply for the money. It is unavoidable, so smart specialisations' choice is not dictated only by regional conditions. It is also strongly influenced by this higher political level and the higher political dimension, which defines the priorities, in quotation marks, the fashions.* (16-BS-PL)

5.4.3.4. Normative isomorphic pressures

S3 has been perceived as a continuation of the previous approach in Polish regions. Thus, very detailed guidelines have been less desired:

> *It is nice that the European Commission did not impose any catalogue or method of defining S3 priorities. Any exercises involving prioritisation, cataloguing or unifying smart specialisations are pointless because they must be defined differently. After all, different industries will be defined differently, on a different level of detail in these priorities.* (2-BS-PL)

> *At the first meeting we had with* [name of a person]*, then dealing with smart specialisations at the national level, it was something where regions had a chance to tell their understanding of S3, at what stage they are, how they approach it. It was already visible that some regions already had their specialisations selected or methodologies defined, and the country was crawling. It was already difficult to talk about a specific combination or a common approach at that stage. Besides, the regions vehemently protested against the mutual approach because we were just far, far ahead. Whatever ideas for common methodologies for the country and the regions were irrational.* (6-RG-PL)

Thus, the quotes above underline two important aspects that speak against detailed guidelines for the approach: the variety of industries at the base of specialisations that require tailor-made procedures and regions' extant methods and ways of pursuing innovation policy that put pressure

for some continuity. However, despite ambiguous attitudes towards standard guidelines in Poland, available guidance, such as RIS3 Guide, has been used, as reflected in the quote below:

> *We took it entirely on wallpaper because the Commission did not accept it. I mean, they accepted our S3 but expected us to do an action plan. As we are the largest beneficiary of structural funds, they desired our strategy and activities to align with this RIS3 manual. Our action plan and the activities we have carried out over the years have accurately reflected the individual chapters in this RIS3 handbook. So we had full coverage. It was the only clue in the stage when few people understood what the concept was all about, so it is good that it appeared, which does not change the fact that we had the most masochistic action plan and the strategy itself. We took it very seriously compared to regions or other countries that have slipped a bit. I also understand that it happened because Poland received vast amounts of money for R&D. This interest of the Commission and such supervision of us was probably also a reflection of this.* (4-NG-PL)

It might be helpful to recall the discussion earlier in this thesis when considering the quote above. Thus, some power vacuum might exist in regions with little experience in S3-related approaches because there are no extant procedures or documents, which could be deemed sufficient or appropriate (e.g., developing an action plan mentioned in the quote above). Therefore, any organisation, which would be in charge of developing such procedures or documents, might desire detailed guidelines to make the work easier. The regions with some previous experience, where extant experiences, procedures and documents are perceived as relevant and sufficient after some alteration, have a distinct situation. Here, explicit guidelines are less desired because of the risk that too many things would have to change and should start anew (the more detailed guidelines, the less room for interpretative viability and customised approach).

In Poland, where S3 has been defined at the national and regional levels, two other initiatives could be found that might be seen as attempts to establish some shared norms and professionalise EDP. One of them is the World Bank project, run as a pilot in five Polish regions. Other is the *Regional Forum for Smart Specialisation*, which the regions have initialised. The Forum also intended to serve as a national platform for S3. Inherent for learning and development of the solutions is that participants of the Forum are constant, which implies that they have the same learning curve, can recall a shared experience and build upon it when developing, e.g., common resolutions, as mentioned in the quote below:

> *We assume that the people who participate in the Regional Forum are rather regular. So that it is possible at individual meetings not to explain certain things from the very beginning, but simply that they would be people who know the subject. Often, people are the same for several years. Thus, they have a great deal of experience in matters discussed. The Regional Smart Specialisation Forum is a group at the Voivodeship Marshals' Convention. The recommendations of the Regional Smart Specialisation Forum are often specified, formulated as projects, resolutions of the Committees of the Marshal's Convention. And then, at the meetings of the Convent of Speakers, things are being settled. So what we recommend in a draft resolution, these matters are resolved at the Marshal's Convention meetings. It is definitely very important. The Forum has been proven with great experience and praised. Besides, the EC recommended that the ministries continue this cooperation in their systemic project.* (9-RG-PL)

As can be noticed, the Forum exhibits formalisation and professionalisation characteristics. It also supports multilevel governance and improves coupling structure. The shared learning experience also implies that if some new region wants to join a forum of this kind, it would not have the relevant absorptive capacity to learn (tacit knowledge, based on shared experiences that outsiders do not have access to). The implication is not relevant for Poland's Regional Smart Specialisation Forum (because all 16 regions already participate). Still, it might hold if there were a similar initiative at the international level and some regions would join later than others. In this way, distinct fields may be built that share the same logic. Ideas from outside that do not relate to the shared knowledge or experiences might be left out. Therefore, an important implication for S3 is that all the elements of EDP develop simultaneously. Otherwise, the process is fragmented or, in other words, characterised by discontinuities.

5.4.3.5. Summary

Table 58 summarises the outcomes of isomorphic pressures in Poland.

Table 58 – Summary: Outcomes of isomorphic pressures in Poland

Isomorphism	Findings
Coercive	- Official documentation as proof of compliance; - Lack of sectoral leadership resulted in drawbacks, regardless of preconditions *(finding connects to the discussion on sectoral governance component)*; - EDP is perceived more successful when there are established leaders for each priority;
Mimetic (national)	- Previously, regions went different paths that, to a great extent, determined their approach to S3; - Because of the variable experiences and capacities, adopting solutions from other regions in the country has been challenging, so no "best practices" are recognised yet, and learning is still in progress; - Mimetic learning also favours the dissemination of approaches that might counter S3 logic if this helps to maintain legitimacy;
Mimetic (international)	- Contextual similarity to the imitated region may affect learning outcomes; - Priority labels follow global trends, which can make it difficult to recognise potential partner regions with a similar S3 profile; - Trends come from different directions and are followed by different actors, which results in a complex flow between different policy levels and between different stakeholders' groups;
Normative	- Custom development of standards resulted from previous approaches and was favoured by relatively vaguely crafted guidelines in the RIS3 Guide; - Standardisation and professionalisation proceed better if actors are at the same level in their learning curves and there is no need to educate newcomers;

Source: own elaboration

5.5.4. Comparative summary: institutionalisation, isomorphism and decoupling

Table 59 comparatively summarises the findings on isomorphic pressures from Lithuania and Poland.

Table 59 – Comparative summary on isomorphic pressures

Isomorphism	Similarities	Differences
Coercive	- Sectoral leadership is vital for the development of specific priorities; - Documents as proof of compliance;	No substantial differences could be observed;
Mimetic	- Easier to learn from similar regions; - Different stakeholders follow trends; - Certain solutions may be adopted by a different stakeholder group as the one who developed them originally;	In Poland, apart from the issue of regional similarity, it is holding to the previous policy approach (perceived as similar and useful), which often affects S3 immediately (strategies build on existing documents or connect to them). This continuity reinforces instead an evolutionary than a straightforward switching of extant practices;
Normative	- Custom development of standards; - Some EDP elements gain more attention than others, possibly resulting in fragmented development; - Established standard might depend on the background of dominant actors *(the finding is supported by discussion in previous subchapters)*	Some initiatives advance common standards across regions in Poland, while in Lithuania, the regional aspect is not relevant.

Source: own elaboration

As noticeable from Table 59, there are few differences in findings between Poland and Lithuania concerning issues and outcomes related to isomorphic pressures. Although starting conditions differed in some aspects (e.g., how much continuity of the previous policy could be observed when designing the approach to S3), these only helped to understand better what might affect the outcome. Hence, the findings are more robust than they would be if the same conditions would lead to different outcomes. Therefore, further elaboration of findings is based on both cases.

Thus, different isomorphic pressures may lead to variable outcomes, depending on conditions summarised in Table 60.

Table 60 – Isomorphic pressures and their impact on institutionalisation under certain conditions

	Institutionalisation	**Unclear Outcome**	**Decoupling**
Coercive	Leadership within selected specialisations exists, which implies a sound governance structure.	Documents can help to gain legitimacy for the applied approach. These might mask deficits, legitimise existing practices or enable learning.	Because of a deficient governance structure, certain groups of stakeholders may lose control over the process (processes get trapped).
Mimetic within the same country (Poland)	Existing practices support S3 and increase absorptive capacity for adopting additional elements of the concept. Reinforcement of the concept's assumptions takes place, and the governance structure supports the processes.	Because of many deficits in the system, the absorptive capacity for S3 is lacking. Due to limited resources (e.g., lacking time or links; human factor), learning may focus on selected aspects, it is incomplete. Reinforcement of the concept's assumptions is hindered, and a modification mechanism works to fill the gaps.	Decoupled learning occurs when strongly modified practices become reinforced and are adapted by other regions for pragmatic reasons (e.g., managing conflicting demands as a simple solution for legitimacy problems). At some point, these might be so widespread that the remaining regions feel mimetic pressures to adopt the same approach.
Mimetic International (additional factors)	"Best practices" can be found in the "similar" regions, which implies institutional proximity and allows establishing corresponding governance architecture.	Transferring experiences is rather difficult if the "best practices" stem from institutionally distant regions. Governance deficits might lead to trapped processes. S3 architecture might be difficult to copy because of different institutional arrangements.	Decoupled learning (same as within a country). Strong path-dependent context (given distance to local institutions) might impede the transplantation of patterns without adaptation. Strongly modified practices and patterns might result in decoupling.
Normative	Clear guidelines and common standards for different stakeholders and the involved organisations might lead to institutionalisation through professionalisation (especially if the "profession of boundary spanners" emerges).	Blur guidelines lead to filling the gaps with independently emerging standards, which might or might not align with initial S3 assumptions.	Concentration on selected aspects might result in fragmentation of efforts and processes. When these do not interlock, it may lead to decoupling. The risk is higher when different actors within the innovation system develop standards independently.

Source: own elaboration

Table 61 demonstrates that policy-makers in Lithuania and Poland have a somewhat different view than the initial assumption of S3. Thus, it cannot be said that the approach has been thoroughly institutionalised, in line with its initial assumptions, but it was modified instead.

Table 61 – Core assumptions of S3 and prevailing views among policy-makers

Aspect	Smart specialisation (initial assumptions)	Policy-makers (dominant view, with some nuanced deviations)
Support for innovation	Focused support by selecting several promising domains to specialise in, considering critical mass.	Supporting almost every innovative project of high quality, considering the scarce landscape of potentially innovative firms.
Prioritisation	As a means of consolidating support and developing competitive innovation microsystem.	As a means of communicating the desired direction of strategic development.
Bottom-up stakeholder involvement	To involve broad groups of stakeholders as a means of discovering promising opportunities. Rationale: knowledge is distributed among many actors and may be accessed if bottom-up communication works (knowledge is locked in the "grass-roots").	Needs high profile experts from the selected areas to verify promising new investment themes. Rationale: people need to be experts in their field to enable high-quality discussion and results.
Implementation	Place-based and tailor-made for the regional needs approach.	Feasible, transparent approach, aligned with EU regulations, relatively easy to administer, monitor and implement.
Monitoring and evaluation	Assumes the strategy has defined goals, and it is possible to measure the progress and evaluate whether the goals have been attained.	Desire information on the progress of every priority, which is often hardly available or resource-consuming to get (simple statistics do not help identify problems, and as a result, these cannot be targeted).
Perceived risk	Inefficient use of funding because of horizontal all size fits all approach.	Failure to absorb funding because of the lack of high-quality innovation projects.
Trends	Avoid duplication of efforts when everyone follows the same trendy themes, select priorities at the mid-level of granularity.	Following trends is necessary not to miss any emerging opportunity.
Approach to strategy and future development	The region has a shared vision, and strategic decisions shape the development (combining deliberate and emergent strategy components).	Directions of development are difficult to predict. Therefore, development is dictated by global trends, and strategy needs to be broadly defined or permanently adjusted (almost solely emergent strategy, with minor deliberate component).

Source: own elaboration

Thus, compliance with the ex-ante conditionality would imply not only creating S3 and selecting priorities but also changing the dominant approach to creating strategic documents from consultation to one based on inclusion and participation. Policy-makers in both countries have been aware of these requirements, as becomes apparent during interviews. Interviewees mention requirements to use *specific methodology* (23-NG-LT) or name the need to run a participative process among the advantages of S3 (11-RG-PL). However, this does not automatically imply that

compliance with the requirements has been easy. It is necessary to note that the observations presented in Table 61 reflect summarised prevailing view, and particular regions still might be closer to the initial assumptions of S3 than others.

The following preliminary propositions can be formulated, summarising the findings on isomorphic pressures, presented in the current subchapter:

Preliminary propositions on **coercive isomorphism**:

Preliminary proposition 5a

> *The effect of coercive isomorphic pressures on S3 institutionalisation might depend on leadership within specific priorities. For the leadership to emerge, priorities should be defined at the appropriate level of granularity (mid-level) and based upon structures aligned with the structures set by the emerging combinations of industries.*

Preliminary proposition 5b

> *Coercive isomorphic pressures in the absence of leadership may also lead to the emergence of façades, which help maintain legitimacy but could result in decoupling.*

The propositions above imply that coercive isomorphic pressures do not automatically lead to the institutionalisation of the S3 approach in the way implied by its initial assumptions. An important factor is the leadership of a priority domain, which may help organise an ecosystem around a specialisation. Leadership may lack if stakeholders do not define priorities at an appropriate level of granularity. Formally, priorities may appear congruent because included technologies or sectors serve the same goal (e.g., construction sector, mining or wind energy all may develop or use technologies that serve sustainable energy). Alternatively, priorities may include sectors that appear to belong to the same domain (e.g., medicine specialisation may include the development of pharmaceuticals, medical equipment, or patient services). However, in both cases mentioned above, these technologies or sectors may be different in their core and not connected by existing network structures. Thus, stakeholders lack a joint base, which they could use to develop new products together, and leadership will not emerge. Therefore, it could be beneficial to combine technologies and sectors in a more unexpected manner, based on how sectors and technologies, classified within the same priority, may utilise each other’s knowledge.

Preliminary propositions on **mimetic isomorphism** between regions of the **same country:**

Preliminary proposition 6a

Mimetic isomorphic pressures within the same country might lead to the institutionalisation of S3 when regions share an absorptive capacity base.

Preliminary proposition 6b

Different bases of absorptive capacities across regions might lead to path-dependent development and inhibit mimetic learning.

Preliminary proposition 6c

Mimetic isomorphic pressures might lead to decoupling when practices that differ from the initial S3 assumptions are easy to implement and ensure the legitimacy of the S3 process on a broader scale.

The three propositions suggest that mimetic isomorphic pressures may lead to institutionalising the initial S3 assumptions if the regions share an absorptive capacity base. In other words, regions need to have similar conditions, such as supporting infrastructure (e.g., clusters with a similar level of development, HEIs or other organisations) that may be necessary to involve when imitating the relevant practices. Another aspect important for the absorptive capacity is the actual capabilities of these relevant organisations to implement chosen practices. Although belonging to the same country, regions often have unique experiences collected in the past. They learned from diverse peers abroad and often possessed different knowledge. When regions utilise these individual experiences, their absorptive capacity to learn more of similar things increases, they may become better at doing certain things, encouraging path-dependent learning and development. Thus, variable approaches can be found. However, regions may adopt certain practices when these are simple to implement and require little absorptive capacity (e.g., choose broad priorities). When such practices contradict the initial S3 assumptions but are widely diffused, commonly accepted and considered appropriate, imitating them may lead to decoupling, especially if implementing the initial S3 assumptions is not that straightforward and requires time for learning.

Preliminary proposition on **mimetic isomorphism** between regions of **different countries:**

Preliminary proposition 7

Mimetic isomorphic pressures between regions of different countries depend on institutional proximity, considering place-based and sector-based institutions. In the international context, mimetic processes are complex, involve multiple objects, and may cross boundaries between regions and demarcation lines between helices (set by institutional logics, which differ between helices). Therefore, it matters for institutionalisation whether mimesis occurs within a helix or between different helices.

Considering the international context, the proposition above complements the already introduced ones on mimetic isomorphism. Thus, mimetic influences in the international setting are even more complex than those between the same country's regions. As already discussed, absorptive capacity remains important. However, institutional settings between countries would usually vary more than within the same country. This variation causes that, even if regions in different countries may be similar in their absorptive capacity and knowledge base, some practices may still be challenging to implement because of the varying institutional framework (e.g., legal conditions, cultural norms). If these institutions are easy to identify and transfer, learning may progress faster. However, some institutions require a long time to change, which may inhibit the immediate applicability of some practices in a certain context (e.g., some approaches may require high levels of trust between stakeholders, which may not be the case in the focal region). An additional aspect is that institutions are not only place-specific, but they also vary between helices. Thus, academia or business have milieu-specific institutions and follow their institutional logic. For simplicity, the demarcation lines between these milieus (in academic literature known as helices, e.g., academia, business, government) may be regarded as boundaries between helices. Therefore, the outcomes may vary when a practice crosses these boundaries (e.g., local government attempts to imitate and implement a practice initially developed in the business helix, such as clusters).

Preliminary proposition on **normative isomorphism**:

Preliminary proposition 8

> *Normative isomorphic pressures might lead to the institutionalisation of S3 when the learning curves of different stakeholder groups get aligned. The emerging profession of "boundary spanners" might support normative isomorphism.*

The proposition above suggests that normative isomorphism may lead to institutionalisation when the learning curves of different stakeholders reach a similar level. In other words, stakeholders should be able to understand each other's position and find a solution that suits all involved partners. It also implies that different helices get closer to each other in their positions, and a "shared institutional space" emerges between them. For this purpose, the "profession" of *boundary spanners* may be crucial. These are people who have experience in different helices and understand institutional logic, common in these milieus. For them, it may be easier to act as mediators and help arrange the goals and develop practices and procedures closer to the optimal solution for all the stakeholders involved. An interplay of conditions mentioned in propositions 5-8 determines whether isomorphic pressures might lead to the institutionalisation of S3 assumptions or result in decoupling. Results might vary not only across regions but also across selected priority domains.

6. Discussion

The chapter discusses findings in the light of neo-institutional theory. First, it suggests the concept of *discontinuity* as a theoretical construct, explaining obstacles to institutionalisation. Further, it elaborates on how deficits in the governance structure, relational structure and power structure cause discontinuities in the S3 and EDP. The resulting model may help analyse separate elements of S3, including relationships between them, and assess where the potential discontinuity might emerge. Second, the chapter connects the concept of discontinuity to isomorphism. It distinguishes *S3 specific conditions*, which determine isomorphic outcomes. Furthermore, it elaborates on how discontinuities related to those factors might lead to decoupling.

6.1. Discontinuity in the development of an organisational field

The subchapter discusses S3 in Lithuania and Poland from the perspective of an organisational field. Given the notion that field boundaries have to be determined empirically (DiMaggio & Powell, 1983) and that numerous studies fail to define the field they analyse (Gore et al., 2019), the current study attempted to explore how the field around S3 might be conceptualised. For this purpose, the elements that might comprise the field have been identified empirically. Critical S3 elements have been established based on the information from the interviews. These elements refer to structures, processes, and interaction mechanisms (between actors and smart specialisation concept). Consequently, they help capture different aspects of S3, including structures and actors and related processes and activities.

Discontinuity emerged as a prominent characteristic of the S3 in Lithuania and Poland, denoting the core category in the theory discovery process. The notion of discontinuity often came up throughout the presentation of the dissertation's findings. Thus, before continuing the discussion, it is essential to define what discontinuity means in the context of S3 in Lithuania and Poland. The following definition can be proposed, based on the findings:

> *Discontinuity is when the process may stagnate, break off, or take a different development path than initially intended because of an interruption or inconsistency. Discontinuity emerges when the process of S3 conflicts with widely accepted assumptions and interpretations of smart specialisation or lacks coherence when translating strategy into*

practice. The consequence of the discontinuity is stagnation of the process, return to previous institutional frame, and, possibly, decoupling.

Hence, discontinuity is an obstacle to institutionalising the initial S3 assumptions.

6.1.1. S3 structures

Research findings suggest that S3 requires a combination of place-based and industry-based governance components. These findings are in line with territorial and industry perspectives of S3, reflected in national (Lundvall, 1992; Lundvall, 2007), regional (Cooke, Uranga & Etxebarria, 1997; Cooke, 2001), sectoral (Malerba, 2002), and technological (Carlsson & Stankiewicz, 1991; Bergek, Jacobsson, Carlsson, Lindmark & Rickne, 2008) innovations system approaches. Thus, results show that focusing on formal place-related governance is insufficient, and industrial or sectoral leadership is paramount in developing priorities and pursuing functioning EDP. Technological and sectoral perspectives underline the importance of technology or sector-specific institutional aspects and stretch beyond national borders.

Thus, researchers suggest that a region's administrative boundaries might not be the most appropriate level for S3 (Pugh, 2018). Concerning specific priorities, interviewees also emphasised that not all relevant stakeholders reside within regional boundaries. Hence, the search for new emerging opportunities might be more manageable when the local industry cooperates with stakeholders outside the region. Such cooperation might be especially relevant if there are disparities between, e.g., business and science specialisations, as has been the case in Lithuania and Poland (ERAWATCH Network, 2006a; ERAWATCH Network, 2006b). It might also connect to the outward dimension of S3, which by now received relatively little attention in both countries. As follows, focus on regional capacities might not inevitably support priorities' development, implying that EDP probably needs to include additional activities, such as searching for potential new relationships and building cooperation networks, eventually extending them beyond regional boundaries. Thus, as communicated in the interviews, multi-level governance and coordination between regions and policy levels might be essential.

A multi-level and tailored approach might be advantageous concerning specific priorities, in line with findings of Asheim et al. (2011), who suggest that some industries rely on a knowledge base that is easier to codify and transfer. For example, priorities that base upon symbolic knowledge

might strongly draw from the local knowledge, which is tacit. Therefore, every priority requires local support but of a different kind, depending on the specificity of relevant sectors and technologies. However, the current research project found that priorities are still treated equally without accounting for specific sectoral and technological innovation systems. Thus, a discontinuity in EDP may stem from a mismatch between territorial and sectoral governance components and a lack of functioning multi-level governance, allowing to leverage priorities across territorial levels.

It is also crucial to map the relationships between relevant stakeholders to develop a sectoral governance component within a specific priority. Findings suggest that collaboration works better if there is some complementarity and mutual benefits instead of competition. Respectively, the way priorities are defined might determine the search directions. When the definitions do not match relational structures, the search in the envisioned direction might never happen. An example might serve ICT priority in Lithuania, initially classified under the transport and logistics priority domain. However, it appeared not workable and, with the update of S3, ICT was singled out as a separate priority domain. Still, it can be observed that the priority combines well with the domain of inclusive and creative society. Hence, in this case, a mismatch between the priority structure described in strategic documents and its relational structure can be observed, which might cause a discontinuity in the implementation.

The power structure is another relevant aspect of governance. Findings suggest that stakeholders' possibilities to influence the process depend on their embeddedness into governance structure, which also might provide them with the power to act. The type of engagement and its intensity depends on the perception of the own role. The relatively common self-perception of policy-makers as administrators delimits their role in S3 to administering and supervising activities. Such a view may be partly congruent with EDP assumptions that stakeholders search for opportunities and policy-makers find ways to facilitate their implementation. However, reality in Lithuania and Poland shows that policy-makers often have to compensate for weak organisational structures within other helices (especially in the business sector), lack of self-organising capabilities and leadership, and poor cooperation ability between stakeholders when aligning goals. Therefore, public authorities took the organisational role, and EDP was intended to occur in the "invited spaces" (Cornwall, 2008). It also demanded much more from the policy-makers than what they have been doing so far.

Table 62 provides an overview of how deficits in specific structures might lead to emerging discontinuities and relates the findings from the study to the concepts in the current academic literature.

Table 62 – Linking structures and theory

Structure component	Source of discontinuity	Issue	Relevant theoretical concepts
Place-based and sectoral governance components	A mismatch between territorial and sectoral priority boundaries;	Lack of functioning multi-level governance to leverage priorities across territorial levels and places;	- *Combined perspectives on innovation systems* (Boschma et al. (2017); - *Knowledge bases* (Asheim et al., 2011);
Relational structures	A mismatch between priority description and extant or potentially developing relationships between sectors	Lack of sectoral governance structures capable of generating leadership;	- *Related variety* (Frenken et al., 2007; Hidalgo et.al; Boschma & Iammarino, 2009); - *Sectoral and technological innovation systems* (Malerba, 2002; Carlsson & Stankiewicz, 1991; Bergek, Jacobsson, Carlsson, Lindmark & Rickne, 2008);
Power structures	Relevant stakeholders are not sufficiently embedded in the governance structure;	"Empty spaces" are filled by other stakeholders that do not necessarily have the power or capabilities to pursue all the relevant tasks;	- *Network theory and the notion of embeddedness* (Granovetter, 1985); - Literature on *participation, collaborative governance and governance models* (Pierre & Peters, 2005; Ansell & Gash, 2008; Quick & Feldman, 2011, Reed et al., 2018;)

Source: own elaboration

6.1.2. S3 documents and their implementation

The processes comprise another S3 component (priority setting, implementation, monitoring, evaluation), and their outcomes are visible in the strategic documents and analytical reports. The quality of S3 architecture and the coherence between the structures (implying institutionalisation of formal structure) determine processes' efficiency and outcomes.

Even though EDP is assumed to be an iterative and ongoing process, research findings suggest a dividing line between *phase 1*, before adopting official S3 documents, and *phase 2*, when official S3 documents were already in force. Additionally, it may also be seen as a transition from the strategic (planning) to the operational (implementation) level and refers to the reinforcement mechanism's depth context.

The discontinuity during the transition from phase 1 to phase 2 may be interpreted in line with Kroll (2019a) as the lack of coherence because of failure to translate priorities into measures, allowing to consolidate support. The transition from phase 1 to phase 2 may vary across countries and regions and result in different degrees of institutionalisation of the S3 approach or decoupling. This variation results from a complex interplay of S3 architecture, processes and reinforcing and modifying initial S3 assumptions in specific places.

Extant literature and findings of the current research project suggest the importance of structure and sectoral governance for developing priority domains. However, organisational structures, such as clusters and supporting infrastructures, such as, e.g. technology parks or incubators, are relatively underdeveloped in Lithuania and Poland compared to developed regions. It has been noted by interviewees and supported by secondary data sources. Initial S3 exercises have also shown deficiencies in underdeveloped innovation systems, specifically, lacking links and cooperation between different helices (science, business, public administration). This challenge has also been symptomatic for many regions and countries of CEE.

Considering the discussion earlier that policy-makers may need to compensate for the low capacities concerning business structures, it has been proposed that official S3 documents could function as such compensation mechanism, given that priorities are defined in a way to provide clear development direction. Inspiration for such a priority definition approach might offer an example from Saxony, which combines promising future themes with regional strengths in KETs and addresses specific industries for transformation (SMWA, n.d.). The findings of this dissertation suggest that official S3 documents are not precise enough to fulfil the compensating role in their current form. Therefore, a discontinuity between official documents and their implementation can be observed.

Another step could be to address implementation issues comprehensively. A good example of addressing implementation in the strategic document is Helsinki-Uusimaa's S3 (Helsinki-Uusimaa Regional Council, 2015). Notably, Helsinki-Uusimaa S3 has an additional element on the implementation side, not sufficiently elaborated in Lithuanian and Polish strategic documents. This element is *innovation platforms*, and it defines different environments where innovations might be created. However, S3 might also support the consolidation of innovation ecosystems, e.g., by encouraging cooperation through carefully designed support for joint projects. Worth consideration

is to adjust financial support measures to specific priorities, which has not been done initially, even though the tailor-made approach would imply it. Initially, S3 focused predominately on priority setting at the national and regional level, while further tailoring the support measures came somewhat short, as did the monitoring.

Therefore, the coherent implementation of S3 and comprehensive monitoring (which implies collecting data for separate domains and priorities) remained challenging. Working groups worked on a detailed description of the priorities. However, the measurement of these priorities' progress and how the wording of the priority formulation connects with the practicability of gathering evidence on implementation appeared to gain less attention. There are still plenty of tasks to be done, such as developing a comprehensive monitoring system. Despite the financial programming perspective 2014-2020 is moving towards its end, monitoring solutions are still not optimised. For example, in Poland, helpful information comes from the projects' statistics when evaluating POIR and qualitative information through the smart-labs solution. However, it is not entirely clear how sustainable this monitoring approach is, considering stakeholders' willingness to participate. Besides, information from POIR may not be sufficient as it cannot deliver evidence from the markets. The importance of markets and demand received relatively little attention during S3 exercises in Poland and Lithuania. However, a similar situation might also be observed across the EU.

6.1.3. S3 actors and interaction mechanisms

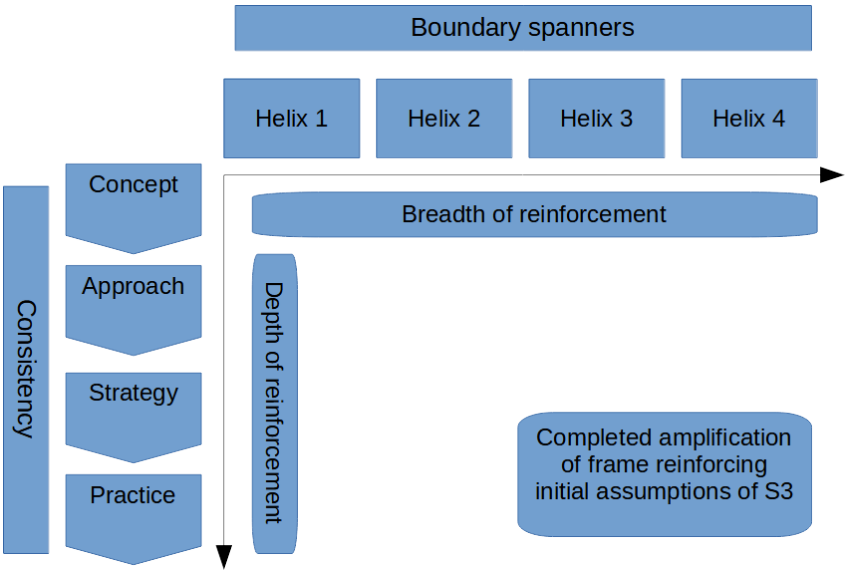
S3 represented a novel approach and encouraged discovering new domains, so it required reconfiguring extant fields. Therefore, the newly defined fields had to emerge, and their structures had to become institutionalised, preferably in line with the S3 assumptions. Respectively, two institutionalisation mechanisms of S3 principles could be distinguished: *reinforcement*, which implies the diffusion of the concept and related practices and their implementation in congruence with the intentions of concepts' authors, and *modification*, implying adaptation of the concept related practices to own context. In the context of this dissertation, considering the findings, mechanisms of reinforcement and modification may be explained as follows:

> *Reinforcement means that actors adopt S3 in line with the initial assumptions. The concept diffuses across stakeholders and policy levels, meaning that assumptions do not change but get reinforced as they become institutionalised. Modification means that actors interpret, adapt and re-frame S3 assumptions to fit their own needs, further developing the dominant*

view of what S3 and EDP are. Modification can result in rejecting initial assumptions as inappropriate or not feasible, consequently fostering divergence between the initial idea and the dominant view of how EDP and S3 must be understood.

Interpretation clash may occur during diffusion of the concept of smart specialisation and its assumptions, as discussed in the seminal literature about proper implementation, e.g., through EDP. The process of diffusion and reinforcement can be related to the "travel" of the ideas described by Czarniawska and Joerges (1996) and later elaborated by Czarniawska-Joerges and Sevón (2005). There are different dimensions of reinforcement mechanism, which are in line with the *amplification of frame* described by Gray, Purdy, and Ansari (2015). However, in S3, reinforcement also implies an *amplification of frame* across levels of policy application, meaning the movement from top to bottom. Hence, there is a movement from an academic concept to the operational level and practical implementation of specific policy measures. Another dimension of reinforcement implies an *amplification of frame* between different stakeholder groups (broadly defined as different helices) and corresponds to increasing the scope (Gray, Purdy & Ansari, 2015). Finally, the concept may be reinforced mainly through the discourse and the involvement of a broad scope of actors. In line with this, the reinforcement's scope and depth dimensions emerge, as depicted in Figure 10.

Figure *10 – Reinforcement mechanism and its dimensions*



Source: own elaboration

Interpretation clash may occur when different stakeholders have a variable understanding of the core concept. Hence, there may be some potential conflict if no consensus is found. Therefore, *boundary spanners* - people who understand the specificity of the different contexts within

individual helices and can translate ideas and support different stakeholders in their implementation - play an essential role in reinforcing the framing congruent with the initial S3 assumptions across stakeholders' groups. The importance of *boundary spanners* is also appreciated in the RIS3 Guide (see: European Commission, 2012, p. 21, p. 38, and pp. 78-79). The depth dimension means moving towards more detail. It may reveal some deficits or underdevelopment of the concept and trigger the emergence of integral practices, i.e. when stakeholders create some necessary practices for the concept to work because those are not clear at the higher levels of abstraction. Consistent reinforcement across levels implies a smooth translation process and implementing strategic decisions.

However, as the concept diffuses, the contextual arrangements and attitudes may change. Thus, the concept may also be modified. Interviewees indicated that some activities needed adaptation, and various good practices from other regions could not necessarily be introduced because of the different institutional contexts. Such interaction between actors and the S3 concept, including related practices, aligns with the broader perspective of institutional work and practices that actors may conduct to change or maintain institutions (Lawrence & Suddaby, 2006; Zietsma & Lawrence, 2010; Lawrence, Suddaby & Leca, 2011). The current research project could identify modification as a mechanism, which actors employed to adapt S3 to their needs. These findings align with Gray, Purdy, and Ansari (2015), who suggested that new frames might emerge and, eventually, multiple frames co-exist because of misinterpretation of communicated ideas. However, the dissertation's findings also indicate that modification can compensate for missing information in the concept's description and guidelines.

The findings suggest that endogenous and exogenous factors of the innovation system may encourage modification, and its degree appears to depend upon congruence between S3 assumptions and local context. If there is a dissonance between the two, modification of the concept with its initial assumptions may occur in negotiating the definition of S3 and an appropriate policy to support it. The current research project found that it may occur in three varieties:
1) ***Adding new elements*** implies creating new procedures to fill the gaps or the lacking details in extant guidelines. This type of modification enhances the concept and co-creates and develops it further. Although such add-ons might intend to implement initial assumptions, added elements may not essentially be in line with them. They could also have the potential to modify the concept as a whole. Examples of adding new elements include:

- Designing guidelines/ methodological approach (e.g., EDP design in Lithuania);

- Testing new approaches, tools (e.g., the pilot project of the World Bank in Poland);

2) ***Blending*** means filling the gaps or lacking details with already used procedures and practices, which are perceived congruent with the new approach. Under these circumstances, for different reasons, stakeholders might not be able or willing to abandon existing practices and seek touching points between them and the initial assumptions. When such points are found, the concept serves to legitimise extant practices, integrating them into the new approach:

- Integrating extant approaches/ tools into current exercise (e.g., using the network of observatories in Śląskie to manage EDP);

3) ***Persisting on the path*** implies that existing practices are perceived either as appropriate and fully in line with the new approach or as not directly affected by the new rules to the extent which demands to introduce change. Such a view implies:

- Reinforcing extant procedures and practices (e.g., using the same approach to design financial instruments as in the previous financial programming perspective)

Notably, each variety contains some change potential, although not equally powerful. When new elements are added and new approaches tested, change may be most visible. Blending existing and new approaches may be less spectacular but more comfortable to sustain. Finally, persisting on the path while decoupling or counter-coupling may have a high potential to modify the concept's initial assumptions. How significantly a particular element is present may depend upon the chosen path's measurable success and the mix of antecedents and coercive isomorphic pressures. The effects of the chosen policy path may be classified into the following types:

- Institutional environment and governance;
- Economic effects;
- Cultural effects (perceptions);

Power relations may be seen as an explanatory notion for modification by negotiating the meaning of the smart specialisation concept.

The interplay between the reinforcement of initial assumptions and modification of them in practice is determined by a complex set of different factors (drivers) that drive the development of S3 by EDP in the regions. The drivers may stem from isomorphic pressures and initiatives aiming to bring together institutional pressures from different sides. Therefore, the distinction between endogenous and exogenous drivers emerges.

Endogenous drivers are intrinsic to actors within the innovation system and their way of seeing and doing things, in line with varying institutional logics. Exogenous factors may be seen as isomorphic pressures from institutions beyond S3. These may stem from, e.g., other strategic documents that are not congruent with S3, rules and procedures established by powerful actors that are not included in the process but need to comply with other established institutions. As suggested in this dissertation, the relationship of different stakeholders to S3 has been contingent upon their embeddedness in S3 architecture. Embeddedness determined their possibilities to participate in the process and the outcomes of reinforcement and modification. The interaction among different stakeholders can be considered a precondition for implementing EDP as intended by the EC. Therefore, a negative stakeholders' relation to S3 may inhibit the process and cause discontinuity.

Notably, RIS3 Guide mentions that *different policy areas and organisations* are relevant to S3 (European Commission, 2012, p. 34). Thus, inter-ministerial committees could be a solution to integrate a broader policy landscape into S3. Failing to do so may cause a lack of connection of S3 to the economy and activate modifying forces originating from these exogenous policy areas. Favourable drivers may enhance institutionalisation, while prevailing hindering drivers foster modification and eventually decoupling.

6.1.4. A framework to analyse discontinuities in the S3

This research project could identify building blocks that characterised S3 by EDP in Lithuania and Poland and were the sources of discontinuities. The first block includes governance, relational, and power structures. Governance structure reflects formal aspects of structure set to govern the process. Relational structure and power structure are not as apparent. They relate to the four aspects of institutional definition or "structuration", as distinguished by DiMaggio and Powell (1983).

Summing up, formal governance structure cannot be considered institutionalised as long as relational and power structures do not back it. Thus, the three types of structures should be perceived together and can be summarised as *S3 architecture*. Another block refers to S3 processes, understood as different steps of S3, defined in the RIS3 Guide, and transition between them. Finally, the third block includes reinforcement and modification mechanisms, which reflect how actors interpret the concept and employ it in practice, driving the institutionalisation process.

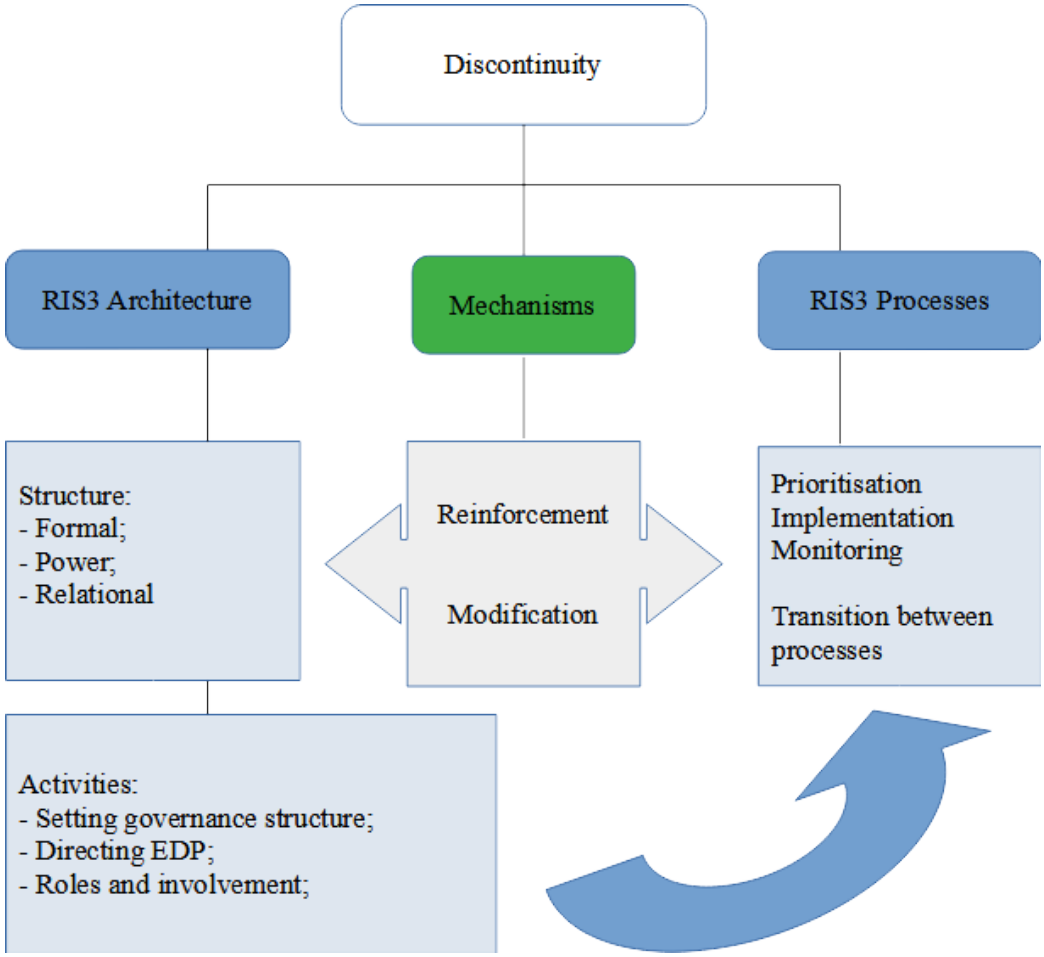
Thus, discontinuity could be observed in different situations:

- While institutionalising S3 Architecture. So, it may occur when formal and relational structures do not fit together, or power structure favours skewing the process towards a specific group of stakeholders to a much greater extent than S3 would imply.
- While pursuing strategy processes (priority setting; implementation; monitoring and relationship between steps, viewed as a transition). In this case, discontinuity might be easier to observe and might indicate the issues with the S3 architecture. Most prominently, discontinuity could be observed when moving from strategy definition and priority setting to implementing the strategic documents (priorities).
- Stakeholders might adjust their actions to the initial S3 assumptions to a greater or lesser extent for many reasons (e.g., misinterpretation, lack of necessary information, need for legitimacy). Thus, discontinuity might occur when modification of the initial principles goes beyond what is perceived as acceptable (e.g., defining broad priority labels without specifying clear descriptions and pointing development direction).

Thus, the deficits in the governance architecture of S3 are sources of discontinuity, which may cause trapped processes when developing and implementing the strategy. The deficits may stem from the clashing interpretations during diffusion and reinforcement of the S3 concept and modifications of existing arrangements in the member states and regions.

Figure11 illustrates the role of discontinuity for the variation of outcomes despite isomorphic pressures.

Figure 11 – *Discontinuity as a theoretical concept explaining variation in the results of isomorphic pressures*



Source: own elaboration

As depicted in Figure 11, structure emerges as the result of activities, and these activities also explain the means through which structure affects the processes.

6.2. Discontinuities and isomorphic pressures

Results of the current research project suggest that isomorphic pressures might act differently. Thus, the results of what becomes institutionalised may vary, depending on the nature of discontinuity and where it emerges. A possible consequence is decoupling and, eventually, modification of the smart specialisation concept. The subchapter elaborates on how discontinuities might affect the outcomes of isomorphic pressures.

6.2.1. Coercive isomorphic pressures

Despite coercive pressure to develop S3 by EDP, available guidelines were perceived as not detailed enough. As a result, some states and regions struggled with the process. After reaching consensus and adopting official strategic S3 documents, the theme of leadership within priorities emerged. The leadership issue may be traced back to the deficits in the governance structure. A potential discontinuity when setting a governance structure may stem from the imbalanced influence and lack of a solid sectoral governance component, possibly triggering decoupling. When S3 priorities are defined, and the transition to the implementation phase occurs, the role of stakeholders becomes even more prominent. From this point, a genuine search for opportunities within specialisation domains could happen, resulting in promising innovation projects. However, interviewees reported on the discontinuity of the process and lack of orientation between stakeholders. The sectoral governance issue emerged in Lithuania's and Poland's contexts. Remarkably, even the regions, considered good examples in Poland, noticed the need to strengthen sectoral aspects of governance. Hence, establishing leadership within specialisations emerges as a solution across regions.

It should be noted that leadership research in the context of S3 is scarce. This dissertation could identify no significant studies that explicitly address leadership issues while conducting a systematic literature review of S3. Likewise, the extensive literature search on the neighbouring concepts in the fields of innovation policy, innovation systems, governance, and participation rendered no distinct studies.

In response to the European Commission's coercive pressure, member states and regions also needed to show that they developed S3 by EDP. As most of the regions prepared strategies deemed appropriate by the EU, it suggests fulfilling the requirements, at least formally. Indeed, many documents and reports documenting the S3 process in different regions are available. However, the formally correct process does not automatically imply the institutionalisation of S3 principles Official documents may also help construct façades that may help to introduce changes gradually or support the decoupling of formal structures from actual actions. Those in charge of policies and programmes' implementation may use documents and reports to build *progressive façades* (the term used by Abrahamson & Baumard, 2008). Regularly issued documents serve as the basis for legitimacy and build a reputation in relevant stakeholders' eyes, demonstrating that process is ongoing. The examples discussed below reflect how published documents strengthen the impression of extensive involvement of business stakeholders in EDP.

Thus, interviewees in Lithuania and Poland emphasised the large scale of business involvement and referenced the documents that should prove this involvement, in line with the concept of building reputation façades (Abrahamson & Baumard, 2008). Documents have been created or already available documents used to serve as sources of legitimacy for the stakeholders, e.g., the European Commission. Even though the more detailed insight into these documents may reveal that reality is not perfect, these documents are vital means of learning. As Abrahamson and Baumard (2008) found, even though the organisations issuing the documents may not necessarily change their actual practices, the presented façades may serve as a good practice for others and might be implemented elsewhere. However, there is still a risk that façades may serve as a means of decoupling and give birth to *rationalised myths*.

Coercive isomorphic pressures could also negatively affect the institutionalisation of the approach. Thus, they may damage stakeholders' readiness to participate in such processes. It might be especially relevant when the governance structure deficits affect power distribution and the relational structure is not functioning well. Such deficits in the governance structure relate to the distinction between systemic and episodic power, as described in the extant literature (Lawrence, Malhotra & Morris, 2012). Lawrence et al. (2012) find that change is likely to occur when systemic and episodic power supports each other. Therefore, as Lawrence and his colleagues proposed, episodic power is more efficient if exercised based on authority and legitimacy and connects to cultural patterns and values supported by systemic power. When stakeholders have the impression that their engagement does not make a difference or is useless, motivation to participate can decrease. At the worst, the trust may be broken, damaging the quality of future processes.

When the change is initialised in the system's core – a systemic power source – the key actors' narratives and language support desired effects of systemic change (Lawrence et al., 2012). In connection to S3 and EDP, this would imply that key actors within different stakeholder groups would positively talk about S3 and the need for businesses to participate in the exercise, which would increase trust in processes and willingness to take part. Some specialisations lack such key actors. Thus, the theme of leadership within specialisations arises again.

Thus, when leadership is inadequate, and specialisation's development stagnates, actors may experience that they lack control over the process. However, holding authority and legitimacy, combined with engagement, may increase the probability of actors' active response towards loss of

control to get it back. Actors' weak power and legitimacy to decide may cause their passive reaction. However, when active reaction implies seeking external advice, this may not necessarily bring control back to the focal actor (e.g., policy-maker or specific organisation) but result in control delegation (e.g., empowering experts to control the project selection process). Still, it appears not to threaten the power position of the leading actor, as far as institutionalised mechanisms of controlling agents, to whom it has been delegated, exist. For example, the project selection in Poland is delegated to experts, but agencies may select experts in a transparent process and evaluate them against the feedback from applicants. Likewise, policy-makers may still control the process while delegating tasks to external consultants or other stakeholders. It holds as long as policy-makers have enough expertise in-house to understand the evidence or outcome they receive and are free to decide (e.g., defying pressure and selecting priorities despite extensive evidence presented by different sides). Differently, collecting too much evidence (inventorying technologies and being afraid to miss anything) might cause policy-makers to be overwhelmed by the lots of details or "paralysed by the analysis", failing to prioritise at the mid-level of granularity, which is deemed appropriate for S3. In such a case, the balance between bottom-up and top-down moves towards other stakeholders and policy-making might become fragmented and possibly horizontal (when nearly everything is prioritised as long as it is in line with, e.g., global trends or EU priorities).

Table 63 summarises the possible outcomes of coercive isomorphic pressures.

Table 63 – Possible outcomes of coercive isomorphic pressures

Antecedent/Reason	**Sources of discontinuity**	**Examples**	**Action planned/ taken**	**Outcome**
Leadership within priority domains	Governance structure (lacking sectoral governance component)	Lithuania; Pomorskie	Appointing leaders within specialisations	Correcting S3 architecture
Building façades	Clash of interpretation; Modification	Lithuania; Śląskie	Demonstrating actions (e.g., documenting process)	Accounting for legitimacy
Losing control (episodic power)	Governance structure; Trapped processes	Lithuania, Poland	Adapting to the situation	Bouncing back

Source: own elaboration

6.2.2. Mimetic isomorphic pressures

Results suggest that time pressure and encouragement of finding own path to conduct EDP impeded mimetic isomorphic pressures at the initial stage. Consequently, regions concentrated on presenting their approaches as suitable instead of searching for best practices. Notably, some regions could build on favourable conditions developed during the past approaches while implementing similar policies previously. It allowed such regions to function as prominent examples for disseminating their practices, while others struggled with the approach. The primary source for experience sharing among Polish regions has been Regional Smart Specialisation Forum, established as a regional initiative.

Previous experiences and adaptation of S3 to the current policy path most often determined Polish regions' policy choices. The reasons behind continuing the extant approach are twofold. Sometimes regions had accumulated experience with their current approach and perceived it as appropriate (S3 as nothing specifically different). In other cases, the timing of S3 was perceived as unfortunate (extant strategies just adopted, and it would be unfeasible to reject them without waiting for the results and start everything anew). Hence, the variance of approaches resulted much from the previous practices and their impact on S3 development. However, initiatives as Interreg or Regional Forum for Smart Specialisation are examples of a conscious search for the best practices and common approaches for the regions. Mimetic learning has also already taken place. There are institutionalised practices, such as, e.g., qualitative interviews with stakeholders, that are common in different regions and are an essential part of EDP, while reliance solely on statistical data is perceived as incomplete evidence. Much of the learning from different regions occurred in the past, resulting in enhanced absorptive capacity for S3 and EDP and the variety of chosen S3 development paths. However, there are indications that many regions are still in the learning process and "incomplete learning", as will be discussed below, is merely the case.

Incomplete learning implies that the institutionalisation process is not exhaustive yet. It means that there may be practices already accepted and used, but these are not automated. Imperfections may be noticed and improved. Indications of incomplete learning, which relate to different aspects of S3, could be observed in Poland's regions. In learning by imitation, modifications may take place. Hence, there is a risk that developments may take a different direction than intended. The reasoning behind incomplete learning is that the experiences of others are perceived as inspirations but not recognised as the best practices yet.

One risk is the emergence of precedents that deviate from initial S3 logic but are commonly accepted. If these fit regions' context, mimetic isomorphic pressures work adversely, fostering institutionalisation of inconsistent practices. An example of such practice may be broadly defining specialisations. Suppose the region defined specialisations in congruence with assumptions but struggled to move forward. At the same time, there was an available "deviant" example, but the "congruent" one, which would fit the regional context, lacked. In that case, the process may bounce back, as the region may imitate "deviant" experiences. It might imitate decoupled practice because of favourable conditions while maintaining ties with other regions. It would also align with Westphal and Zajac (2001) findings, who speak of vicarious learning through maintenance of network ties.

However, broad and unspecific priority labels are not exclusive to Lithuania or Poland and its regions. S3 Platform abounds with examples of abstract priority labels among leading countries and regions. Thus, as the systematic literature review elaborated, countries and regions leading innovation rankings have treated S3 superficially and often continued their policy approaches. Notably, these regions have strong innovation systems and are less dependent upon Structural Funds. Stakeholders can develop and implement innovative solutions with less tailored support. Therefore, horizontal approaches in leading regions might be more efficient than in the lagging regions, which were supposed to benefit most from introducing S3.

Tables 64 and 65 summarise likely outcomes of mimetic isomorphic pressures. Table 64 addresses the regions within the same country (Poland), while table 65 refers to additional antecedents and outcomes observed internationally (among EU member states).

Table 64 – Possible outcomes of mimetic isomorphic pressures among regions within the same country (PL)

Antecedent/Reason	**Sources of discontinuities**	**Examples**	**Action planned/ taken**	**Outcome**
Existing practices as a source of absorptive capacity (might be lacking)	(Lacking) governance components, which might serve as S3 architecture	Śląskie, Pomorskie; Warmińsko-Mazurskie	Presenting own experiences as working EDP	Collective shaping of S3
Incomplete learning	Lack of suitable "ready-made" solutions among good practices, paired with loosely defined requirements, leaving room for interpretation	Lithuania, Poland	Developing lacking elements	Collective shaping of S3
Decoupled learning	Evolutionary policy development path, paired with loosely defined requirements	Śląskie; Lithuania	Adapting to conflicting demands	Re-defining initial assumptions of S3

Source: own elaboration

Table 65 – Possible outcomes of mimetic isomorphic pressures among EU member states

Antecedent/Reason	**Sources of discontinuity**	**Examples**	**Action planned/ taken**	**Outcome**
Institutional proximity (or lack thereof)	(Lacking) similar experience	Regions with a similar level of development, e.g., Lithuania and Latvia; for Polish regions - often regions from the Czech Republic or Hungary	Potential for collaborative initiatives	Isomorphic outcomes
Transfer of experiences between institutionally distant places	Institutional proximity/distance (may vary for place and industry dimensions of innovation system)	Transfer of experiences from more developed regions might be successful at the industry level but fail at the policy level	Mimetic learning or modification of original practices	Rationalised myths in case of institutional distance; successful transfer of practices in case of proximity
Transfer of experiences between institutionally distant fields (different helices)	Lacking the capacity to compensate for missing S3 architecture elements modification	Business-induced clustering initiatives in the USA vs Public sector induced clustering initiatives in CEE countries; Modification.	Decoupling	Diverging practices

Source: own elaboration

6.2.3. Normative isomorphic pressures

As noted earlier, normative isomorphic pressures stem from the development of common standards and professionalisation (DiMaggio & Powell, 1983). Besides, there also have to be respective actors (Fuenfschilling & Binz, 2018) who conduct educational activities (Zeitz et al., 1999). Because S3 has been introduced as a tailor-made approach and expected to fit the regional context, respective guidelines provided by European Commission (in the form of the RIS3 Guide) have been rather vague. They indicated steps to take and aspects to consider, leaving freedom for the regions to decide upon the design and implementation of these steps. As a result, standardisation at the European level could be deemed weak. Thus, in Lithuania, some stakeholders perceived a lack of guidance. In Poland, attitudes concerning common guidelines have been ambiguous, but the RIS3 Guide was used.

Thus, it is unclear how the specific procedures would look if they were to ensure desirable results in S3 and other related approaches (e.g., deliberative democracy, participation). The plea is towards individual solutions as different cases impose distinct challenges and bring different preconditions. Therefore, standardised explicit procedures are lacking. Still, there is a kind of normative theory, pleading for the deliberative solutions across the contexts. Regarding the above, there is a risk that regions may focus on selected aspects of EDP and professionalise them. When these aspects apply to some actors and organisations but not to others, the field becomes fragmented and characterised by multiple logics, in line with Lounsbury (2007). Thus, a *variance of practice* might be observed (Lounsbury, 2001). A consequence of such selective professionalisation might be that S3 assumptions get reduced to specific aspects, resulting in decoupling from the holistic structure propagated by the initial premises and RIS3 Guide.

For the variety of EDP approaches to be recognised as congruent with S3 assumptions, it may be necessary to specify the essential attributes that should be met for the approach to be classified as EDP. Another logical step could be to define the minimal contextual requirements for these approaches to thrive, including what could be modified in adaptation to the specific conditions and classified as EDP. RIS3 Guide attempted to do so. However, there are contrasting opinions on whether it is sufficient. Hence, S3 has a considerable degree of interpretative viability, which may fuel misinterpretations and result in *misfirings* and *laminations* that Gray et al. (2015) described.

Respectively, the findings suggest the importance of people or organisations that connect different environments and multiple fields' logic. These entities are crucial for the emergence of normative isomorphism in the field. The term, well describing such entities, is *boundary spanners,* used in management literature for the *people who cross their organisations' boundaries*. Notably, RIS3 Guide also acknowledges the problem of professionalising collaborative activity between different actors and suggests including *boundary spanners* into governance structure (European Commission, 2012, p. 21). As further elaborated:

> *"In order to moderate the RIS3 design process, actors playing the role of boundary spanners between the organisations are needed. These are actors endowed with an interdisciplinary knowledge or experience of interaction with several different types of organisations; hence they can facilitate new connections across sectors, foster new conversations between disciplines, and inject novelty into the process. This, in turn, helps to overcome the sectoral and disciplinary silos that reproduce old habits and routines, lockin regional economies into their traditional paths of development."* (European Commission, 2012, p. 38)

Therefore, the institutionalisation of S3 and EDP resulting from normative isomorphic pressures implies the emergence of *boundary spanners as a "profession"*. Consequently, they can form a coherent organisational field, guided by respective institutional logic, following the principles of S3. Extant research shows that professional associations might be important drivers of organisational change as they pursue "theorisation", which is a process of conceptualising organisational failings, justifying possible solutions, and creating moral or pragmatic legitimacy (Greenwood, Suddaby & Hinings, 2002, p. 60).

Table 66 summarises the possible outcomes of normative isomorphic pressures.

Table 66 – Possible outcomes of normative isomorphic pressures

Antecedent/Reason	**Source of discontinuity**	**Examples**	**Action planned/ taken**	**Outcome**
Guidelines and standards	The vague definition of the requirements leaves room for interpretative viability.	Podkarpackie, Śląskie, Pomorskie	The cluster-based approach in Podkarpackie, Observatories-based approach in Śląskie, or interest-based partnerships in Pomorskie	Establishing a unified approach to the process within a selected region
Emerging standards	Joint initiatives non-existent, or these lack formalisation/ legitimacy to decide upon solutions;	Poland, Lithuania	Developing a monitoring system based on the specificity of selected priority	Multiple standards may exist, with an unknown result.
Selected aspects	Fragmented process, with separate groups working on different aspects, with little consideration of the adjacent processes	Lithuania, Poland: Priority setting process, project selection process	Establishing criteria and selecting appropriate experts	Separately evolving processes might lead to the emergence of multiple "subsystems" of the whole; decoupling in the case if convergence does not occur;

Source: own elaboration

6.2.4. Explaining outcomes of isomorphic pressures

The present research is also embedded in the extant literature that has been discussed in the theory chapter. Table 67 provides a brief overview of the connections between the findings and well elaborated theoretical concepts. In this way, the research also helps to sort extant concepts into a comprehensive theoretical framework. The framework plausibly explains the actual presence of isomorphic pressures and their impact on the institutionalisation of S3 in Lithuania and Poland.

Table 67 – Links between results and previous theory

Isomorphic pressure	Antecedent/Reason	Prevailing Mechanism	Likely Outcome	Related Concepts
Coercive	Existing leadership (in the specialisation domain)	Reinforcement	Institutionalisation	Invited spaces (Cornwall, 2008)
Coercive	Building façades	Reinforcement/ Modification	Institutionalisation/ Decoupling	Façades (Abrahamson & Baumard, 2008)
Coercive	Losing Control	Modification	Decoupling	Episodic and systemic power (Lawrence, Malhotra & Morris, 2012; Lawrence, 2017)
Mimetic	Existing experiences	Reinforcement	Institutionalisation	Absorptive capacity (Cohen & Levinthal, 1990)
Mimetic	Incomplete learning	Reinforcement/ Modification	Institutionalisation/ Decoupling	Interpretative viability (Benders & Van Veen, 2001)
Mimetic	Decoupled learning	Modification	Decoupling	Vicarious learning (Manz & Sims, 1981; Denrell, 2003)
Mimetic	Similar experiences (Level of institutional similarity, which creates institutional proximity)	Reinforcement	Institutionalisation	Fast-moving and slow-moving institutions (Roland, 2004)
Mimetic	Transfer of experiences (Different institutional logics)	Reinforcement/ Modification	Institutionalisation/ Decoupling	Path dependence (persistent learning paradigm, Capello & Lenzi, 2016); Institutional logics (Thornton & Ocasio, 1999)
Mimetic	Transfer of experiences (Different organisational fields and institutional logics)	Modification	Decoupling	Institutional logics (Thornton & Ocasio, 1999); Organisational field (DiMaggio & Powell, 1983)
Normative	Guidelines and standards	Reinforcement	Institutionalisation	Role of professional organisations (Greenwood, Suddaby & Hinings, 2002)
Normative	Emerging standards	Reinforcement/ Modification	Institutionalisation/ Decoupling	Interactive framing perspective (Gray, Purdy & Ansari, 2015)
Normative	Selected aspects	Modification	Decoupling	Variance of practice (Lounsbury, 2001; 2007 2008)

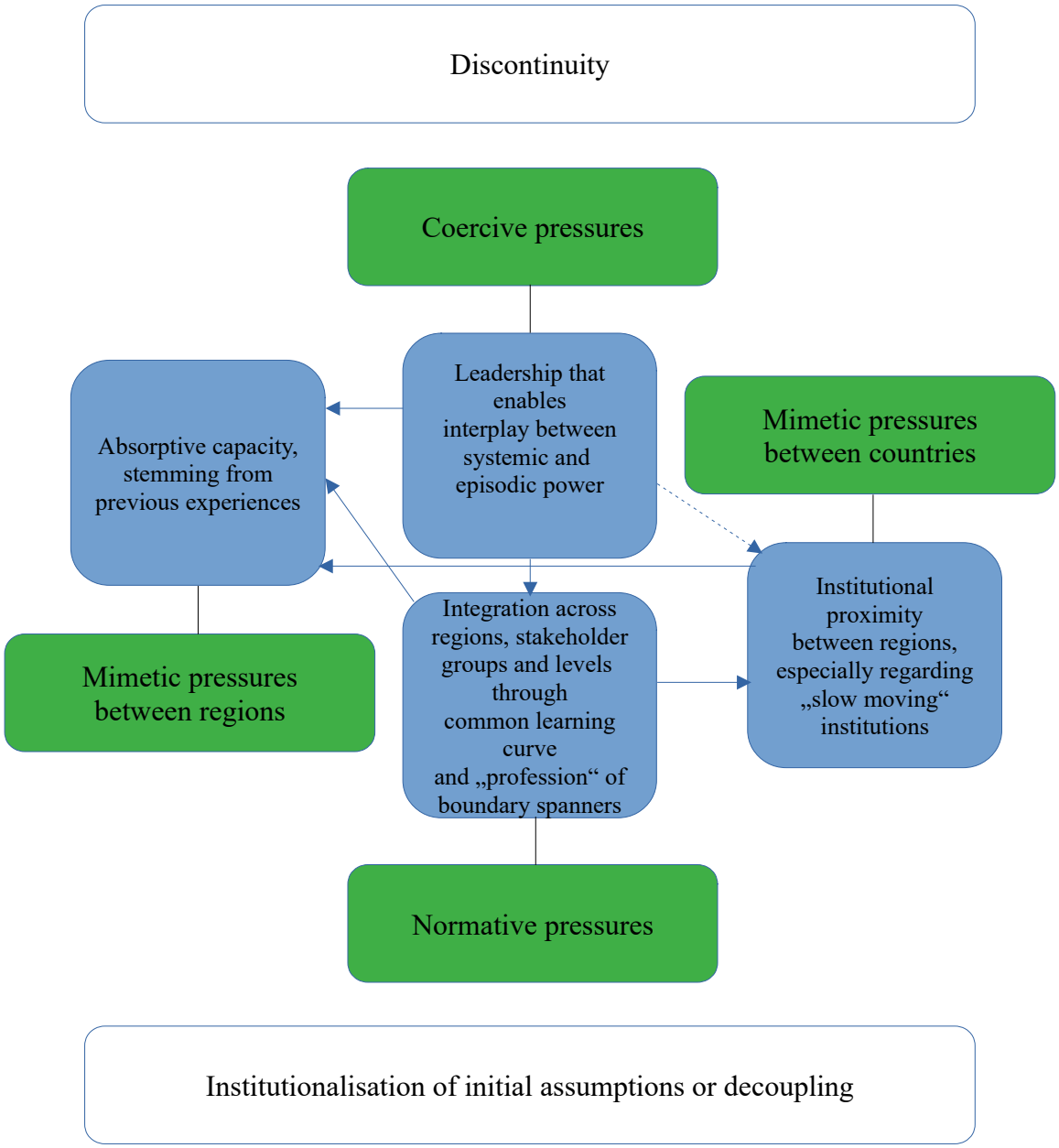
Source: own elaboration

According to the framework proposed by Zeitz et al. (1999) for evaluating institutionalisation across five proposed bases, the following conclusions can be made:

1. **Modelling (mimetic pressures)**. Although initiatives collect “best practices” (e.g., Interreg Platform, S3 Platform), participants view them as inspirations rather than solutions to be copied and comprehensively implemented.
2. **Culture (identities communicated via formal and informal mechanisms)**. Generally, official national and regional documents and S3-dedicated websites communicated EDP principles congruent with the S3 concept. Furthermore, policy-makers in their majority declared that EDP and S3 are important and suitable for their region. However, these principles sometimes collided with other institutions and practices or were difficult to implement. Consequently, not everything preached is also simultaneously practised.
3. **Education (normative pressures).** There are many activities for the policy-makers, organised by S3 Platform or Interreg Platform, among others, and Lithuania and some Polish regions actively participate in them. However, educational activities for other stakeholders are somewhat limited and mainly focus on support measures, availability of funding and application procedures. Therefore, there is a gap between S3 related knowledge, which policy-makers and other stakeholders possess, affecting the strategy co-creation process.
4. **Regulation (coercive pressures).** EC demands continuous EDP as an enabling condition for the financial programming period 2021-2027, meaning that coercive pressure on the Member States to persevere with S3 persists.
5. **Technical rationality (perception of measurement effectiveness)**. Advancement of monitoring varies across regions and also between Lithuania and Poland. Some mechanisms are already established, but monitoring systems are still to be improved. Qualitative evaluation is also part of monitoring in both countries; however, it appears more prominent in Poland than in Lithuania. On the other hand, Lithuania has more detailed quantitative monitoring than Poland at the national level.

To conclude, whether the institutionalised practice will be congruent with initial assumptions of S3 or decoupled depends upon different conditions identified in this study and summarised in Figure 12.

Figure 12 – *Determining conditions whether isomorphic pressures might lead to the institutionalisation of S3*



Source: own elaboration

As shown in figure 12, coercive pressures may lead to institutionalisation if leadership within priorities exists and balances an interplay between systemic and episodic power. Mimetic pressures foster institutionalisation when the regions share previous experiences, resulting in similar levels of absorptive capacity, which also concerns regions within the same country. Additionally, the similarity of institutions (understood as institutional proximity) plays an important role concerning mimetic pressures at the international level. Institutional proximity is especially relevant concerning institutions that do not change easily (e.g., institutions related to social norms, culture). Finally,

normative pressures may enhance the institutionalisation of initial S3 assumptions when the regions and various stakeholders possess a comparable knowledge of S3. Thus, it implies alignment of learning curves, which may be supported by boundary spanners (people who link various stakeholders). When the abovementioned conditions are not met, isomorphic pressures may lead to decoupling instead of institutionalising the initial S3 assumptions. Moreover, the conditions mentioned above are interdependent and may affect each other (as indicated by the arrows in figure 12). Thus, conclusive leadership by an orchestrator may increase absorptive capacity within a distinct specialisation domain or act as a boundary spanner. The punctuated arrow marks a less obvious and weaker link.

7. Concluding remarks

7.1. Summary of research approach and context

The study's purpose was to explore defining and implementing S3 and explain probable reasons for inconsistencies in implementing the guidelines prescribed by the European Commission in these countries. As indicated in this dissertation, learning progress may vary between different stakeholders and groups of actors involved. Therefore, the study adopted the neo-institutional theory perspective, which allows conceptualising change as institutionalisation concerning both the process and outcome at the given points of time.

Regions had to develop S3 to access ESIF (European Structural and Investment Funds) in the EU financial programming perspective 2014-2020. Distinctive features of S3 include selecting a limited number of R&I domains to be supported and searching for these domains pursuing EDP, which implies engaging broad circles of stakeholders (considering quadruple helix basis) into participative policy-making activities. More precisely, these activities are known as the six steps of S3: analysis of regional context, governance, developing a shared vision, prioritisation, creating policy mix, and monitoring and evaluation (European Commission, 2012). The reason behind developing S3 by EDP is that regions have limited resources to ensure tailor-made support to everyone (therefore need to prioritise). Consequently, to minimise the risk of selecting "wrong" priorities, they should be evidence-based. S3 also appreciates that the evidence is distributed across various stakeholders and innovation system actors. Therefore, it can be collected when these carry their knowledge together (the need for EDP).

S3 was deemed a policy experiment (Foray, 2018b), lacking a theoretical background (Foray, 2015). The scientific community reported many challenges to implement the approach and even saw it as a "wicked game" (Lundström and Mäenpää, 2017). Moreover, regions had to develop their strategies in time to access ESIF. Against this background, the working thesis adopted for this dissertation has been:

> The official documents called *smart specialisation strategy* have not led to the genuine prioritisation and did not result in consolidation of public support for R&I during the ESIF programming period 2014-2020 in Poland and Lithuania.

Thus, the research problem focused on discovering the antecedents and reasons that policy documents labelled as smart specialisation strategies have not led to genuine prioritisation and did not ensure the possibility of consolidating public support for R&I during the financial programming period 2014-2020 in Poland and Lithuania. The research had an explorative and explanative nature. It developed in an iterative process between empirical findings and existing theory.

The systematic review of S3 approaches across the EU indicates differences in developing and implementing S3 at the fine-grained territorial level within the same country. Many of these differences could stem from the deficits in governance arrangements. Notably, in the regions with well-organised business stakeholders, as clusters in German regions, S3 could be easily implemented despite a simplistic prioritisation process (Kroll, 2019b). Other countries, e.g., Lithuania, put much effort into designing and implementing EDP, especially the priority setting, but struggled with strategy implementation. Therefore, different obstacles across regions hinder improvements in S3 governance. These include a slow learning process, persisting old institutions and reluctance to engage in S3, resulting in the simplistic approach to prioritisation. Literature also shows that priorities in different regions do not necessarily match regional potential and the related variety approach remains unexplored.

The literature review also revealed numerous challenges to S3 related to the following aspects:

1. Power distribution and influence;
2. Path dependence;
3. Perceptions, attitudes and culture;
4. Regional and sectoral (technological) dimensions of S3;
5. System capacity to implement S3 (structures and process supporting activities);
6. Stakeholders- and governance-related challenges (roles, motivation, arrangements).

Furthermore, the challenges are intertwined. Hence, path dependence might result from either cultural aspects or established power structures.

Even though it is still too early to assess the effects, initial studies indicate that S3 might trigger change if further pursued and if the learning process is in place. Moreover, reviewed extant research suggests that a tailor-made policy approach, considering regional context and targeting specific priority domain, might provide better results than undifferentiated horizontal policies, which speaks for continuing S3.

7.2. Summary of findings

Empirical research for this dissertation focused on Lithuania's and Poland's experiences with S3. The study addressed the S3 characteristics in these countries, the transition from priorities to their implementation, and different stakeholders' relationship to S3 (considering their involvement and attitudes). Furthermore, it analysed whether coercive, mimetic, and normative isomorphic pressures have resulted in the institutionalisation of initial S3 assumptions or whether the decoupling has taken place. Data collection included 38 semi-structured interviews, along with the analysis of extant documents, such as strategies, operational programmes, reports, information materials, presentations, websites, and other publicly available materials. Grounded theory tools, such as *coding*, *Conditional Relationship Guide* and *Reflective Coding Matrix*, were used to analyse the interviews. The extant documents' role has been twofold. First, these have been used as background information for the interviews, encouraging reflections on particular issues. Second, they served to verify the conveyed information and supplement what is difficult to convey verbally.

The following sections provide answers to the research questions. At the end of each section, an exhibit summarises propositions derived from the findings.

7.2.1. S3 and emerging structures of an organisational field

The section addresses the research question on S3 characteristics in Lithuania and Poland. It also partly addresses the research question on stakeholders' relationship to S3.

S3 development in Lithuania and Poland might be described as a process of organising the field, where isomorphic pressures could lead to institutionalisation. An essential element of the organisational field is its structure. S3 structure results from three types of activities: setting and leveraging the governance system, designing the process and setting directions for EDP, and involving particular stakeholders.

The first activity is **setting and leveraging the S3 governance system**, considering territorial and industry dimensions. S3 governance is complex because the strategies might be developed at different levels (national, regional). Additionally, priorities rely on industry and technology-specific structures. From the public administration's perspective, one of the core tasks is balancing responsiveness (which increases with more autonomy) and synergy (achieved through centralising and standardising procedures) in the multi-level governance model. Lacking centralisation and

standardisation within and across territorial units might result in unaligned administrative capacities. Consequently, it demands additional coordination work at different (EU, country, operational) levels to exploit synergy potential. However, such a solution might be advantageous because it retains responsiveness. Another task is to integrate the sectoral governance component into the governance system. Concerning this, *the business ecosystem* perspective (Moore, 1996) might be helpful. It emphasises leadership or anchor organisation(s) around which other actors might organise their activities. Alternatively, regions with solid clusters might benefit from their organisational and leadership potential. The influence should be balanced between different stakeholders and within particular groups, such as, e.g., business or government sector that could be mistakenly perceived as homogeneous, to ensure inclusive, functioning EDP and collection of reliable evidence.

Another activity affecting the S3 structure is the **design of the process and setting directions for EDP**. On the one hand, ex-ante conditionality demands participative and, recently, continuous process (coercive influence). On the other hand, past policies with their practices might already exist in the regions. These are often combined with the newly introduced approaches and determine the balance between top-down and bottom-up, degree of participation, and means for stakeholders' involvement. Furthermore, EDP implies a particular direction for the search, expressed as a priority. Therefore, ensuring the feasibility of EDP involves considerations on establishing appropriate priority boundaries, especially concerning the coupling structures among innovation system actors (relevance of industry perspective and boundaries of technological and sectoral innovation systems).

Priorities might need the development of specific structures, reflected in the sectoral innovation system (Malerba, 2002; 2004) and technological innovation system (Carlsson & Stankiewicz, 1991) perspectives. Consequently, it also implies considerations on appropriate geographical level for the selected priorities (some of these systems might stretch beyond regional or national boundaries, while others organise more locally, which results from the type of knowledge bases they draw upon). Therefore, it is essential to account for both industry and geographical perspectives to ensure the appropriate search direction supported by the coupling structure. Hence, it might be beneficial to consider geography more differentiated, including cross-regional and localised approaches, despite that S3 was introduced as a regional policy.

Involvement within particular groups of stakeholders might also determine the quality of the S3 structure. Particular attention might need three aspects: engagement of the policy-makers, participation incentives for other stakeholders, and establishment of helix coalition. Extant literature suggests that the state might not be viewed as a homogeneous entity (Pierre & Peters, 2005). In line with this, findings imply that the engagement of the policy-makers depends upon their perceived role and organisational capacity, which might vary between different state-comprising organisations. Therefore, organisations that coordinate priority-setting and organise EDP are inclined to adopt a facilitator-perspective. At the same time, those concerned with accountability to the EU level and management of structural funding view themselves as administrators.

Moreover, results indicate that policy-makers might need to compensate for the missing organisational capacities and lack of organised structures in other helices in the weakly developed innovation systems. Especially it concerns the roles that clusters, business support organisations or other stakeholder initiatives conduct in a well-developed innovation system. Such a task goes beyond what S3 implies. If policy-makers lack specific capacities, they may seek help from external organisations (e.g., consulting companies, universities, experts). "Help" might range from editing the documents, collecting evidence, organising EDP events, up to support the stakeholders in further developing and implementing their priority domain). One tension that emerges when considering what to do in-house and outsource is between clear responsibility and strategy ownership on the one hand and ensuring neutrality and increasing legitimacy of the choices on the other hand. Noteworthy, one is not automatically better than the other. It rather depends upon context and specific tasks. Thus, e.g., when organising competitive calls, external experts might help evaluate the potential of selected priorities or the feasibility of projects. Especially if policy-makers lack the necessary technical knowledge and if local experts would be the same who submit the proposals (therefore could be captured by interest to advance own domain). When external organisations prepare analytic reports and evaluations, it comes to the policy-makers ability to understand the evidence, draw appropriate conclusions, and make decisions on that basis. It might be of little use if mountains of evidence are collected and no choices are made and implemented. Also, if the policy-makers prepare strategic documents and trap into using some specific jargon, it might be helpful to "translate" documents into more "user-friendly language".

Notably, stakeholders need to fulfil different tasks within specific S3 domains, including:

- Leading and organising;
- Monitoring the developing priorities and their implementation;

- Representing the community;
- Maintaining a dialogue with the policy-makers;
- Ensuring visibility in the political arena;

These tasks are crucial for priorities to succeed, and policy-makers might hardly compensate for them. When stakeholders cannot fulfil these tasks for the specific priority domain, policy-makers might be well-advised to revise whether such a domain is feasible to support. Decisive might be whether a coupling structure between domains' stakeholders exists or can be relatively easily established. It implies determining relevant stakeholders through, e.g., mapping exercise, finding whether a shared base for cooperation exists, and organising cooperation (e.g., establishing collaborative platforms, finding spaces to come together, initialising networking events). In this context, it is essential to note that stakeholders often can find ways to come together without the policy-makers help when such a potential exists. Therefore, it might be advantageous to identify and support emerging initiatives rather than forcing cooperation top-down or pulling it with the financial incentives without other support types.

A trade-off between resource dependency (on public funding) and time needed to devote to the process might determine stakeholders' motivation to engage in S3. Therefore, to enhance involvement, incentives for specific stakeholders might be created. One consideration might be focusing on the relevant time frame and proper strategy perspective.

When specific stakeholders do not fulfil their roles, other stakeholders might need to compensate for it. Stakeholders from different helices may not recognise benefits from collaboration or lack a shared knowledge base, serving as a cooperative background. In other words, stakeholders might be located at different learning curve points concerning specific aspects. In such a situation, it might be beneficial in the long run if the policy-makers take educators' role (to convey a shared vision and commit stakeholders to work towards its achievement and strengthen awareness, possibly resulting in the capacity building within specific helices). Therefore, policy-makers might act as "fashion setters" for other stakeholders. Furthermore, an elaborated stakeholder mapping might be necessary to assess crucial stakeholders and what roles they need to fulfil for the priority to succeed. Such mapping could serve as a starting point for considering and evaluating involvement strategies for the selected organisations or stakeholder groups.

Exhibit 3 – S3 as an emerging organisational field: summary of propositions

Proposition 1a:

From the multilevel governance perspective, centralisation to achieve synergies at the expense of local autonomy could inhibit S3 implementation at the lower levels (considered vertically, across territorial levels, i.e., national-regional).

Proposition 1b:

Deficits in the sectoral governance component may cause difficulties in attaining critical mass around a specialisation domain at the mid-level of granularity.

Proposition 1c:

The choice to design S3 and EDP as a continuation of the previous approach or as something new has implications for the process. However, it does not inevitably affect the result (e.g., formulations of priorities in the official documents as broader fields with detailed lists of specified technologies), which depends on the chosen method (in both countries, it has been a foresight-based approach).

Proposition 1d:

EDP in Lithuania and Poland can be characterised as a multi-search process, which runs independently in separate priority domains and within established territorial boundaries (e.g., regional or national). Because of this, the EDP, initialised by the policy-makers, may not fit the natural relational structures between stakeholders that may cross administrative boundaries of the regions, as findings from Poland suggest.

Proposition 1e:

The development of an S3 priority may depend on the fulfilment of the specific tasks (domain structuring, identification of opportunities, democratic legitimation, articulation of interests, image creation). When stakeholders do not accomplish these tasks and policy-makers cannot compensate for this (with their human resources or help from other actors, e.g., consulting companies, universities), the development of the S3 priority could stagnate.

Proposition 2:

Stakeholders' engagement in S3 might depend upon their self-perceived role in the process (varying between being a source of information and co-decider) and embeddedness in the network structures, allowing them to leverage the power and affect governance.

7.2.1. S3 documents and implementation

The section elaborates on the S3 prioritisation process, priorities implementation, and monitoring. Consequently, it answers the research question on the transition to the implementation phase of S3 documents.

Official S3 documents contain priorities and their description. However, not any type of priority might be considered to be in line with S3 assumptions. Analysis of S3 strategies shows that the current approach to priority setting still needs to evolve towards genuine prioritisation, simultaneously avoiding three typical **pitfalls**:

- Setting **priorities as goals without specifying means** (technological dimension) and target audience (sectoral dimension). Strategic priority implies that it is clear who might work towards a specific goal and what technological potential is available for use. Goals are often broadly defined and driven by global trends (e.g., green economy, or digital economy). Thus, selecting such priorities might result in horizontal policy and duplication of efforts, countering the purpose of S3.
- **Identifying technologies and industries** in the region, ranking them according to their strengths, but **avoid prioritising** investments. Such an approach raises awareness of the economic structure in the region, its strengths and available potential but fails to envision strategic development directions. Furthermore, strategies become complex, priority descriptions expand over numerous pages. Extensive work on regular strategy updating might be necessary for strategies to remain flexible and exploit new opportunities. Moreover, coordination work might be needed to avoid duplication across priorities. If business stakeholders lack the time necessary to devote to these tasks, strategies might become "science-driven" or technocratic. Paradoxical, priorities might be perceived as too broad (anything might fit in) and narrow (certain combinations not listed, project difficult to assign to specific priority) simultaneously.
- Priorities get fragmented while focusing on the **specific elements instead of integrating** them into the whole (e.g., targeting technological development separately from the innovative applications of these technologies in the chosen domains). An approach focused on the development of specific technologies or sectors might inhibit genuine prioritisation. In the context of S3, it might be perceived as a "picking the winners" approach and lack legitimacy.

Moreover, too detailed priority descriptions (listing different possible technologies) and fragmented priorities might channel EDP into various directions without reaching critical mass and suppressing potential discoveries from combining the assets. Notably, stakeholders might differently understand the implications of S3 and prioritisation for the implementation. S3 is deemed as a tailor-made approach, with special attention to the regional context. Research indicates that successful implementation might tailor support for specific priorities, considering potential beneficiaries' characteristics. Currently, in Lithuania and Poland, the majority of tools do not differentiate between priorities. Standard calls dominate, and few measures target specific priorities to consolidate projects and funds in the specific domains. Defining and targeting priority in line with S3 would imply precision. For example, Artificial Intelligence (AI), supporting human learning and

teaching, instead of generally AI, including application in medical diagnostics or mobility, where region might not have the potential for combination due to the lack of critical mass of firms working in respective sectors. Therefore, funds would be scattered if single AI projects would be financed in these domains. Given broadly defined priorities, which often contain extensive lists of technologies and lack direction for future development, such an approach would also be unfeasible. Firstly, policy-makers would have to determine the calls' themes unless there is continuous EDP and organised discussions with different stakeholders. Such a procedure is currently the case in Poland, where stakeholders set themes and implement pilots through *smart panels* (discussion format) and *smart labs* (working groups). However, the scope of the themes covered with EDP in Poland appears narrower than S3 priorities. Secondly, policy-makers might lack the capacity to organise and coordinate dozens of separate initiatives simultaneously to keep EDP continuously going and facilitate the realisation of the potential simultaneously in all the domains. It would require solid organisations and appropriate structures among other relevant stakeholder groups, who would uptake these roles. Otherwise, the support becomes somewhat ad-hoc and punctual. Promising initiatives might be taken up but left alone too early to stand on their own.

S3 monitoring and evaluation might provide the necessary feedback for improving prioritisation. For the monitoring to fulfil its role, different aspects should be considered for each specific priority. S3 implementation handbook mentions five types of indicators, comprising baseline monitoring system (output of projects, result concerning socio-economic objectives, implementation state, structural change and specialisation, and context) (Mieszkowski, Gómez Prieto & Nauwelaers, 2016).

Regions also have specific needs and challenges when it comes to monitoring. On the one hand, the system should be simple and automated enough to enable data collection regularly (most indicators yearly). On the other hand, it should enable monitoring of cross-sectoral priorities and multiple strategy levels. Therefore, it might also be beneficial to consider what indicators should be monitored at the respective levels to exploit synergy and ensure enough details at the individual levels. As follows from the implementation handbook, indicators of output, result and implementation state are usually available in the implementation programmes, contributing to S3 (Mieszkowski, Gómez Prieto & Nauwelaers, 2016). Context indicators are available in the national and regional statistics, usually collected by the statistical offices (Mieszkowski, Gómez Prieto & Nauwelaers, 2016). Hence, the most challenging might be defining and collecting indicators to measure structural change and specialisation.

Consequently, these might be more priority-specific and defined together with stakeholders involved in the prioritisation process. Suppose priorities are backed up by solid clusters or other stakeholders' connecting organisations. In that case, these might have sufficient knowledge of the developments in their domain (given that the organisation is based upon a functioning network and its members communicate regularly, have meetings or other events to discuss relevant matters). Suppose such organisations are involved in EDP and are well-connected with the policy-makers. In that case, they might provide such information as part of qualitative monitoring and substitute for surveying many enterprises (which may be less sustainable in the long run if entrepreneurs get "tired" from participating in research activities and answering regularly similar questions).

A region could include some aspects allowing for monitoring respective developments, considering multi-level strategy and priorities' relevance at the interregional level. Publicly available data might be collected and combined to provide relevant evidence. It might combine analysis of cooperation patterns, e.g., based on the intensity of cooperation in international research programmes (such as Horizon 2020), with the qualitative analysis of the project types with selected partners. These might also be extended and combined with other data, e.g., analysis of patents or scientific cooperation (checking co-authoring publications), if relevant for specific priority. Consequently, such analyses might provide insights into the potential innovators' networks and identify key players in the regional innovation system and their embeddedness in internationally operating sectoral or technological innovation systems.

Furthermore, it might be valuable to monitor the goals' achievement set in the OP, financial instruments, and priorities in an aligned mode. In this sense, it might be helpful to assess to what extent selected priorities contribute to achieving goals and to what extent specific measures advance the implementation of priorities.

Exhibit 4 – Implementation of S3: summary of propositions

Proposition 3a *If priorities are defined as goals, S3 becomes more horizontal (because a broader range of business activities can fit into them). If priorities are defined as certain technologies or sectors, S3 tends towards a sectoral approach.* **Proposition 3b:** *There is a lack of serious evidence on whether S3 priorities may develop towards the mid-level of granularity in Lithuania and Poland because the monitoring system does not provide decisive information. Providing such information is challenging because S3 priorities, as they have been defined in the official S3 documents for 2014-2020, do not correspond to the conventional statistical categories, and primary quantitative data for S3 are not being collected.*

7.2.3. S3 actors and interaction mechanisms

The section answers the second part of the research questions on the stakeholders' relationship to S3. It elaborates how actors apply the S3 concept and its assumptions and discusses the mechanisms of their interaction with the pressures to comply. Thus, it addresses the question of the evolution of actors' relationship to S3. The current study distinguished two mechanisms that describe the interaction of different actors with the S3 concept and its initial assumptions. The reinforcement mechanism implies that concepts' core assumptions reach all the relevant actors. Moreover, they interpret them correctly and translate them into practice. These assumptions diffuse across horizontal and vertical dimensions.

The horizontal dimension refers to disseminating the concept across different stakeholder groups (helices). In contrast, the vertical dimension concerns different levels (moving from the conceptual level through strategic planning to the operational level and implementation). In practice, unhindered reinforcement would be rare, especially when concerning highly complex concepts as smart specialisation. The reasons for that might arise both from the concept's elaboration degree and the absorptive capacity level as well as the position on the learning curve of those addressed with the concept (stakeholder groups and relevant actors). Consequently, gaps in comprehensive concept elaboration or the conveyed and appreciated message emerge. Modification mechanism allows for compensating these deficits with one of the following actions: adding new elements, blending existing practices into the new approach, or persisting on the current path.

Exhibit 5 – Actors and interaction mechanisms: summary of propositions

Proposition 4a *The S3 approach and its outcome might depend on an interplay between different stakeholders' interpretation of the concept and possibility for the shared learning.* **Proposition 4b** *S3 assumptions may diffuse among different stakeholder groups (scope) and reach different levels within the same group of stakeholders (depth), supporting S3 framing, congruent with these assumptions.* **Proposition 4c** *Clashing interpretations of initial assumptions of S3 might result in modified behaviour of policy-makers and other stakeholders, which compensates for knowledge gaps through adding new elements, blending partial knowledge with existing practices, or ignoring S3 assumptions.*

7.2.4. S3 institutionalisation, isomorphism, and decoupling

The current section addresses the research questions on isomorphism, institutionalisation, and decoupling.

Coercive isomorphic pressures might lead to institutionalising the initial assumptions of S3 if there is a sound sectoral leadership component. Suppose a system is underdeveloped and lacks the necessary architecture to support S3 (especially appropriate power structure). In that case, coercive isomorphic pressures might lead to decoupling because the interplay between *systemic* and *episodic power* (terms, introduced by Lawrence, Malhotra and Morris, 2012) is unbalanced and does not lead to change. Furthermore, regions might build *façades* (term, introduced by Abrahamson and Baumard, 2008), which allow maintaining legitimacy while masking imperfect practices. Façades are important means to facilitate learning by trial and error but might also support decoupling. Hence, the outcome might be difficult to predict.

Mimetic isomorphic pressures among the regions of the same country (Poland) also have variable results. Initially, much variation could be observed among approaches in different regions. These approaches often resulted from the continuation of previous innovation policy practices present in the regions, which have been learned from different peers abroad (e.g., Śląskie's approach somewhat resembles Finland, while Pomorskie's – Germany). Such variation of approaches and established infrastructure leads to differences in absorptive capacity, making it difficult to easily imitate the approach from other regions. Notably, the World Bank pilot project and Regional Smart

Specialisation Forum are important sources of mimetic isomorphic pressures between Polish regions. However, specific practices or approaches are recognised as “inspiring examples” or “experiences” instead of as “best practices”, which should be implemented in the own region. Therefore, it is mostly “incomplete learning”, which could be observed across regions in Poland.

Moreover, some mimetic influences might lead to “decoupled learning”, which implies copying widely practised solutions that are not in line with the initial assumptions of S3. Examples of decoupled learning include having many priorities or defining priorities at a very general level (e.g., healthy society or green economy). Notably, decoupled learning might occur when there is pressure to manage conflicting demands, and there are many examples of deviant practices. It increases mimetic isomorphic pressures, in line with the “vicarious learning” concept (Manz & Sims, 1981; Denrell, 2003).

Concerning mimetic isomorphic pressures between different countries, an indispensable factor appears to be institutional proximity. Notably, institutional proximity might refer both to place-specific and industry-specific institutions. Therefore, to successfully transfer practices, selected regions have to be similar in economic development or industry structure (similar results and outcomes serve as intuitive proxies for institutional similarity). Learning from the more advanced regions might be more accessible if there is a similar institutional base. It is present mainly among business stakeholders engaging internationally (industry-related institutions as a source of absorptive capacity) or academia (if local HEIs are embedded into the global science networks and adhere to international standards). When both place-specific and helix-specific institutions are distant, modification and divergence between what has been imitated and the final results might occur. Therefore, it might be crucial to look at who copies what and from whom.

In this context, it is essential to consider different actors and their roles in the innovation system. Thus, different actors (helices) might be viewed as distinct institutional fields, characterised by variable institutional logic (helix or sector-specific institutions). Recalling that in weakly developed innovation systems, some stakeholders might need to compensate for other stakeholders’ lacking engagement or capacities, these might imitate solutions from abroad. Exemplary, the government sector attempts to compensate for lacking networks and research infrastructure among business stakeholders, triggers clustering initiatives, and creates business support organisations with public funds. However, these are often less successful and operate differently than their counterparts

abroad. In other regions, they possibly adhere to different institutional logic and base their success on tacit knowledge and motivation specific to the business sector.

Furthermore, divergence might be fuelled by different place-specific institutions (e.g., incentives for academia to commercialise research stemming from national policies). To conclude, in the context of such complex exercise as S3, there are multiple objects, which might be affected by isomorphic pressures (practices, structures, and content of documents, e.g., priority labels). Moreover, when actors that emanate isomorphic pressures belong to different helix than those who receive them, the transfer may lead to different results because the learning curves are different.

Normative isomorphic pressures stem from standardisation and professionalisation. However, S3 encouraged individual and context-specific approaches. Accordingly, the RIS3 Guide provided broad indications but lacked details. Notably, regions with little previous experience would have welcomed more detailed guidelines to build appropriate procedures and practices. When extant approaches were perceived as appropriate, detailed guidelines were less desired, and flexibility was valued. Conversely, flexibility provides room for interpretation, which may lead to independently emerging standards and variable practices.

Assuming that professionalisation or standardisation concentrates on specific aspects (e.g., analysis, project selection, monitoring) but does not concern the whole, decoupling may occur because some elements remain underdeveloped while others dominate. Thus, the emerging profession of "boundary spanners" could be an important condition for the institutionalisation of S3 concerning normative isomorphic pressures. RIS3 Guide refers to "boundary spanners" as people with interdisciplinary knowledge, able to break extant silos and foster new connections between sectors, disciplines or different organisations (European Commission, 2012). The analysis conducted within this thesis indicates that the professionalisation of "boundary spanning" activities could help to align learning curves and to establish a shared base between different stakeholders. Thus, it could foster the institutionalisation of S3 while improving consistency and coherence through aligned processes.

To conclude, S3 triggered some institutional change. However, it cannot be assumed that the approach is institutionalised according to its initial assumptions yet. Firstly, predominating view among policy-makers still deems uniform horizontal policy as more legitimate, fair, and open for new developments and experimentation than more selective and deliberate S3. Despite declared

prioritisation, consolidation of funds can be hardly observed in practice. Moreover, with updating, priorities often become even broader and less selective, despite reducing their number, and such development is perceived as positive by many interviewees. Secondly, despite declaring continuous EDP in numerous reports and documents, it merely reflects analyses, monitoring activities and updating priorities, rather than practical implementation of priorities. In that sense, implementation is left to applicants for funding in the general calls, open for all priorities, with little priority-specific support for initialising collective search processes and realising a pool of related projects to build a critical mass in specific domains through enhanced complementarities. In this context as positive development should be mentioned staged smart-panel/ smart-lab approach in Poland. However, it appears that the capacity to carry out this approach is much less than the scope of Poland's S3 implied by the strategic documents. Thus, the implementing agencies might be unable to pursue the process in every selected specialisation domain, with all the listed technologies continuously during the whole financial programming perspective. Therefore, even though EDP is continuous and ongoing from the policy-makers' perspective, it might appear punctuated from the perspective of particular specialisation. Thirdly, implementation potential also varies across priorities. Thus, stakeholders can implement S3 with much less facilitation and coordination support from the policy-makers when a strong sectoral leadership component is present. Accordingly, it implies a varying degree of institutionalisation across priority domains (due to varying quality of helix coalition).

Exhibit 6 – Isomorphism, institutionalisation and decoupling: summary of propositions

Propositions on coercive isomorphism*:*

Proposition 5a

The effect of coercive isomorphic pressures on S3 institutionalisation might depend on leadership within specific priorities. For the leadership to emerge, priorities should be defined at the appropriate level of granularity (mid-level) and based upon structures aligned with the structures set by the emerging combinations of industries.

Proposition 5b

Coercive isomorphic pressures in the absence of leadership may also lead to the emergence of façades, which help maintain legitimacy but could result in decoupling.

Propositions on mimetic isomorphism (between regions of the same country):

Proposition 6a

Mimetic isomorphic pressures within the same country might lead to the institutionalisation of S3 when regions share an absorptive capacity base.

Proposition 6b

Different bases of absorptive capacities across regions might lead to path-dependent development and inhibit mimetic learning.

Proposition 6c

Mimetic isomorphic pressures might lead to decoupling when practices that differ from the initial S3 assumptions are easy to implement and ensure the legitimacy of the S3 process on a broader scale.

Proposition on mimetic isomorphism (between regions of different countries):

Proposition 7

Mimetic isomorphic pressures between regions of different countries depend on institutional proximity, considering place-based and sector-based institutions. In the international context, mimetic processes are complex, involve multiple objects, and may cross boundaries between regions and demarcation lines between helices (set by institutional logics, which differ between helices). Therefore, it matters for institutionalisation whether mimesis occurs within a helix or between different helices.

Proposition on normative isomorphism

Proposition 8

Normative isomorphic pressures might lead to the institutionalisation of S3 when the learning curves of different stakeholder groups get aligned. The emerging profession of "boundary spanners" might support normative isomorphism.

7.3. Theoretical contribution

As might be expected from the title, the research conducted for this thesis might provide insights into whether S3 initiated an institutional change in innovation policy in Lithuania and Poland. For this purpose, S3 has been analysed employing core concepts of the neo-institutional theory and related research: isomorphism, decoupling, institutionalisation.

The research findings, supported with existing theory, resulted in the model framework (presented in figure 11), which outlines the emergence and structuring of an organisational field around S3. The model might serve as a tool to analyse S3 and EDP principles' institutionalisation. The core finding is that S3 often stagnates and difficulties emerge even if the development started positively. The persistence of such a situation might result in failing institutionalisation of the S3 assumptions and emergence of rationalised myths, consequently decoupling what is practised from what is preached. Reaching such a point has been labelled a "discontinuity" in the process. A discontinuity implies that the process may stagnate due to an interruption, break off, or take a different development path than initially intended. The model distinguishes between S3 architecture, processes, and mechanisms that may affect them (reinforcement and modification).

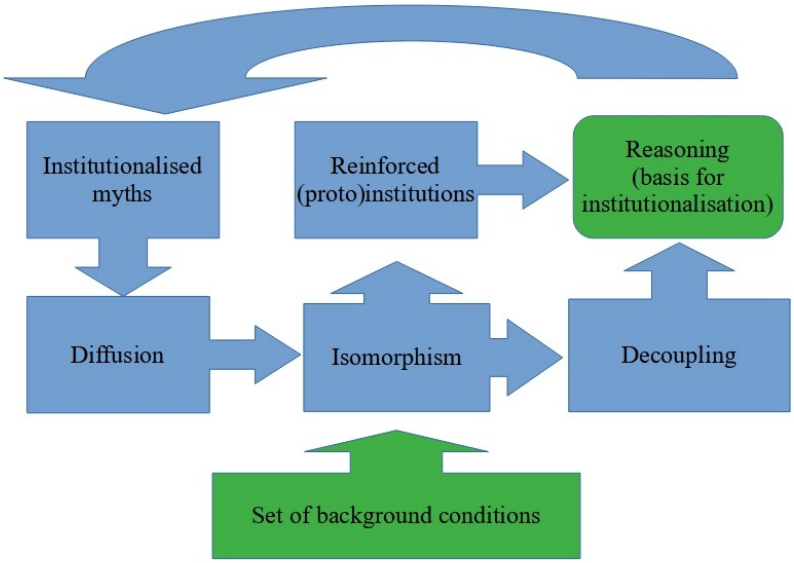
Therefore, S3 architecture results from activities that organise the emerging field and set up three types of structures: physical, power, and coupling. Consequently, it affects the outcome of developing official documents with defined priorities, including their implementation and feedback through monitoring and evaluation (S3 processes). Hence, S3 architecture and processes are potential sources of discontinuity. They might inhibit the development of the organisational field and distort isomorphic pressures, with consequences for institutionalisation. The mechanisms of reinforcement and modification determine how actors understand and use the S3 concept and its assumptions in practice. As actors interact, they share their interpretations with others. Therefore, the mechanisms affect diffusion objects (assumptions of S3) and may favour the emergence of rationalised myths and decoupling.

Research questions relating to neo-institutional theory allowed decomposing approach to S3 in the regions and analysing its possible outcomes connected to different types of isomorphic pressures: coercive, mimetic and normative. Therefore, each of the pressures might cause variable results: the institutionalisation of initial assumptions or decoupling. Sometimes the result is difficult to predict (regarding the highly nuanced antecedents and different possibilities to respond to specific

isomorphic pressures). Noteworthy, in practice, isomorphic pressures act simultaneously. Therefore, the final result depends upon their interplay and interaction. However, the proposed theoretical model allows understanding better how particular antecedents might influence the outcome of specific isomorphic pressures in the context of S3.

To conclude, isomorphic pressures might not necessarily lead to the initial assumptions' institutionalisation. Under certain circumstances, they might favour decoupling and the emergence of rationalised myths. Thus, the dissertation also contributes to existing theory on isomorphism and decoupling. Firstly, it demonstrates that isomorphic pressures might lead to variable results in institutionalising such a complex process as S3, with many actors and elements. The conducted research distinguished a set of determining conditions that lead to variable outcomes resulting from different isomorphic pressures in the context of S3. Furthermore, it shows the influence of determining conditions in the recipient regions on creating new rationalised myths, as institutionalised "mainstream" practices and "decoupled" practices feed into the reasoning of what is a good practice. Consequently, it implies that *rationalised myths* are learning entities and change their labels when they have learned enough and the initial assumptions do not hold. Figure 13 depicts how the contribution of this study fits within a general neo-institutional theory, explicitly connecting to isomorphism.

Figure 13 – *Contribution of the dissertation to existing theory*



Source: own elaboration

Secondly, the study connects determining conditions to different well-established concepts in organisational theory. Thus, it attempts to theoretically verify assumptions of S3 and elaborate when and why these might or might not hold. In this sense, it connects S3 to the extant research in management and organisation theory.

Thirdly, although still young, research on S3 started developing in few different directions, especially concerning place-based and industry-based perspectives, stemming from different innovation system approaches. The current thesis accounts for both perspectives, demonstrating their relationship and the consequences for institutionalising S3.

7.4. Addressing the research problem

S3 by EDP in Lithuania and Poland could be characterised as an emerging organisational field with developing governance architecture, including formal, power, and coupling structures. Ideally, the architecture should be set so that governance structure supports a balanced distribution of power and establishes channels for continuous and uncomplicated communication within and between helices (all the field's organisations). The deficits in these structures result in the discontinuity of institutionalisation. Implementation of S3 might depend upon selecting an appropriate territorial level for specifically defined priorities and providing sufficient autonomy at that level, covering the complete strategy process, from selecting the goals (priorities or pilot projects) to controlling the means of their implementation (funding). Unaligned administrative capacities might cause duplication of efforts, inconsistent communication, and system fragmentation, negatively affecting multi-level governance efficiency. A solid sectoral governance component might provide clear development direction from the perspective of industry/technology and determine the effectiveness of the S3 governance structure for specific priorities, consequently affecting the implementation of the strategy. The sectoral governance component might be weaker because of the representation issues, meaning that some stakeholder groups might be under-represented and have little influence on the strategy, despite their relevance to the implementation.

Successful development of selected S3 priority domains depends upon engagement of all relevant stakeholder groups, their organisational capacity, and their ability to fulfil relevant tasks. When these elements are weak, other stakeholders or policy-makers might need to compensate for deficits if they have the capabilities, legitimacy, and power. The relationship of different stakeholders to S3 has been contingent upon their embeddedness into S3 architecture. The kind of embeddedness

determined their possibilities to participate in the process and shared learning. Lacking embeddedness may cause discontinuity in the process.

In the light of extant literature on S3, it may be naïve to expect that policy-makers in the lagging regions may have sufficient policy capacity to compensate for the tasks that other stakeholders do not fulfil. Instead, official S3 documents might serve as a compensation mechanism for deficits in the innovation system, characterised by underdeveloped industry structures, if they are precise and contain appropriate priority definitions. Appropriate priority definition implies a formulated goal, means, and potential recipients for change. A monitoring system failing to provide feedback on how the three elements of selected priority (goal, technology, industries) develop might cause discontinuity in EDP. When policy-makers lack information on whether an organisational field with appropriate structures is developing around specific priorities, it will be impossible to assess whether consolidation of public funding will be in place. Consequently, priorities without consolidation potential might be further supported, resulting in a horizontal innovation policy.

Thus, official S3 documents in Lithuania and Poland could be deemed not precise enough to compensate for the deficits in innovation systems. Consequently, the transition to their implementation revealed discontinuity in the consistency of S3, including challenges for establishing a monitoring system. When priorities are not precise and stakeholders cannot self-organise, S3 might fail to consolidate funds. Exhibit 5 summarises the resolution of the research problem.

Exhibit 7 – Addressing the research problem

Discontinuities caused by deficits in governance structures have characterised the emerging organisational field around S3. The deficits may stem from poor coordination of multilevel governance, misaligned administrative capacities, weak sectoral governance component, the unbalanced influence of different stakeholders, lack of balance between top-down and bottom-up approaches when designing the process, inadequately pre-defined priority fields or regional boundaries, insufficient engagement of relevant stakeholders, lack of coalition between stakeholders. These deficits appear within distinct priorities, defined in the official S3 documents. Consequently, strategy implementation and monitoring at the level of distinct priorities have been affected, resulting in minor consolidation of funds and predominately horizontal innovation policy.

7.5. Practical implications

The proposed model framework (Figure 11) can be adapted for practical use and serve as a tool to support the systematic identification of potential problems within S3. Such systematic diagnostic could enable a holistic view and possibly improve policy responses to specific challenges stemming from the shortcoming in the extant innovation system. The proposed framework might be helpful to capture the complexity of S3 because it allows to decompose it without decoupling certain aspects from the whole. Therefore, compared to the six steps approach described in the RIS3 Guide, it might better visualise interactions between different elements and address the weak parts while considering the broader context. Moreover, being aware of potential pitfalls, policy-makers might consciously search and analyse specific examples and practices in other regions, considering implementation possibilities in their own context.

Firstly, the framework underlines fundamental elements of S3 structure and governance. Previous studies from advanced regions underlined the importance of governance and organisational capacity to implement innovation policy goals. The current study identifies activities that determine these structures in the context of S3. In this context, determining structures for every priority is especially relevant because a necessary element is the sectoral governance component. Therefore, policy-makers can approach these activities in a reflected manner and consider relevant structures from the perspective of selected priorities. If the priority is defined in a manner that does not reflect the cooperative network structure between relevant industries and firms, the leadership within that priority domain will not emerge. Consequently, its implementation might fail.

Secondly, the framework shows that structures set through specific activities affect the outcome, including official documents and their implementation. Official documents contain priorities, which often represent broad labels. Comparing priorities across countries, the practice of using broad labels is common. However, the situation in Lithuania and Poland is not directly comparable with the advanced regions. These regions often have well developed industry-based structures (e.g., clusters), which are able to set goals for further development and commit themselves to their implementation (including own funds). These structures are much weaker in Lithuania and Poland, and firms rely on public support and funding for their innovation activities. In line with S3, they demand tailor-made solutions. Therefore, it implies that official documents should be much more precise concerning priority definitions because they need to compensate for lacking self-

organisation of industries. Ideally, a priority should specify the goal (e.g., cleaner environment), the means to achieve it (which technological solutions could be used), and the industries addressed to accomplish the transformation. Hence, priorities would be expected to trigger the formation of relevant structures for the implementation, leading to the consolidation of the domain around selected themes and emerging "micro-cosmos for innovation", as envisioned by Foray (2016a). In this context, it is also crucial to monitor the developments in networks of innovators around specific topics and define priorities at the appropriate level for their implementation (e.g., regional, national).

During the research process, interviewees emphasised that business stakeholders are often concerned with immediate results and show little interest in discussing the region's long-term development. Given the complexity of the S3 environment and numerous organisations involved, perhaps the most appropriate strategy type for S3 at the higher aggregation level would be an "umbrella" strategy as described by Mintzberg and Waters (1985), meaning that some general boundaries are defined, with the freedom to manoeuvre within them. Such common borders or guidelines might be defined broadly and represent some vision, while details emerge at lower aggregation levels as different actors follow the vision or guidelines' direction.

Consequently, business stakeholders' involvement might make more sense when discussing implementation-related issues and concrete topics instead of deliberations on priority wording and description of its content. For this purpose, it might be more appropriate to identify core organisations that could organise stakeholders downstream (e.g., clusters, anchor organisations within innovation ecosystems, or other overarching organisations). Furthermore, discuss with them development directions. Suppose solid partners from the business sector are lacking. In that case, it could be feasible to support the emergence of innovation ecosystems around HEIs potential, focusing on entrepreneurial education and commercialising research results. Suppose the institutional environment does not support the HEI-centred approach. In that case, policy-makers could define distinct priorities based on available evidence, connect them to regional identity, and persuade other stakeholders to work towards that vision. Furthermore, emphasis on non-financial benefits, such as prestige or networking, might enhance stakeholders' engagement.

Thirdly, S3 implies breaking extant structures and silos and fostering new constellations for cooperation. It concerns traditional division into government, academia and business, and the usual classification of industries and sectors (e.g., NACE). Re-combining the boundaries of what is

perceived as a homogeneous population of organisations is challenging because each of these populations developed its own "language", rules or codes of appropriate behaviour. Consequently, finding the people who are able to span the boundaries between different stakeholders might be crucial for priorities' implementation.

7.6. Limitations

The study explored S3 related processes in Lithuania and Poland, focusing on institutionalisation, isomorphism and decoupling. Despite theoretical and practical value, the study has several limitations.

Firstly, the timeline chosen for the study included the financial programming period 2014-2020. Therefore, longitudinal developments of innovation policy in Lithuania and Poland have been accounted for only partially. Nevertheless, it could be argued that the choice of the timeline provides more benefits than disadvantages. The research setting has been unique in that EU member states had to adopt the S3 approach not necessarily by their own choice but by enforcement through European Commission, which concerned the aforementioned financial programming period. Consequently, development was not merely evolutionary but required to prepare S3 quickly. The study outlined how an organisational field emerges and identified discontinuity in that process as an inhibitor of change. It also identified antecedents to discontinuity. Thus, including extensive longitudinal analyses of previous policy would extend the scope of the thesis, with little value for the studying emergence of an organisational field under coercive pressure.

Secondly, the study contributes to the neo-institutional theory. Thus, it distinguished determining conditions, indicating whether the intended approach might be institutionalised or decoupling will take place. Accordingly, it elaborates how actors embedded in the specific contexts react to isomorphic pressures. Hence, isomorphic pressures might lead to institutionalising initial assumptions or modified versions, depending on the organisational field's conditions. However, these conditions are specific to the context of S3 and cannot be generalised for other study fields.

Thirdly, possible limitations related to the chosen method have been partly addressed in the method chapter. Perhaps still worth mentioning that the current study addressed the emerging and theoretically underdeveloped research topic of smart specialisation. Therefore, the theoretical evidence necessary for developing a solid model for statistical verification might be insufficient.

Consequently, at this point, it might be important to gain an in-depth understanding of the topic from the perspective of relevant organisations and actors. The qualitative study fieldwork allows identifying possible themes and relevant variables from the primary sources. Subsequently, these might be used for quantitative studies, aiming for statistical generalisability of the findings.

7.7. Further research

The results might also serve as a starting point for further research on different aspects discussed in this thesis. Especially promising might be further research concerning determining conditions and their impact in another context than Lithuania and Poland:

1. There is a theme of leadership in the S3. It would be interesting to compare how priorities evolve when different stakeholders take leadership. A possible research question could be how similar domains develop when EDP is led by, e.g., university, cluster, implementing agency or large firm.
2. It might be interesting to research how the region's absorptive capacity is built and how stakeholders' embeddedness into different international networks affects its development.
3. A promising research theme might be exploring the emergence of new organisation fields resulting from the convergence of extant fields and institutional proximity's and distance's influences on the outcomes of mimetic isomorphic pressures.
4. It might also be interesting to research "boundary spanners", responsible for organising and facilitating EDP within particular specialisations. Exploring whether a "new profession" with distinct rules and standards might emerge or these will converge with the logic common for some other helix (e.g., due to power relations) could expand the knowledge on developing organisational fields and their institutional arrangements.

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Appendix 1 – Systematic literature review: supplementary materials

Table 68 – Search queries in WoS and Scopus

WoS	TS=(smart speciali?ation) NOT DT=(Book Review OR Editorial Material OR Discussion OR Letter OR Meeting Abstract OR Meeting Summary OR Review)
WoS: refined by areas	WEB OF SCIENCE CATEGORIES: (POLITICAL SCIENCE OR ECONOMICS OR MANAGEMENT OR BUSINESS OR BUSINESS FINANCE OR PUBLIC ADMINISTRATION OR SOCIOLOGY OR SOCIAL SCIENCES INTERDISCIPLINARY)
Scopus	TITLE-ABS-KEY (smart AND speciali?ation) AND (EXCLUDE (DOCTYPE , "re") OR EXCLUDE (DOCTYPE , "cr") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "le"))
Scopus: refined by areas	TITLE-ABS-KEY (smart AND speciali?ation) AND (EXCLUDE (DOCTYPE , "re") OR EXCLUDE (DOCTYPE , "cr") OR EXCLUDE (DOCTYPE , "ed") OR EXCLUDE (DOCTYPE , "le")) AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "DECI"))

Source: own elaboration

Final publications for the review have been selected based on the following criteria:

1 Search restriction with the keywords *smart speciali?ation*, where "?" is used to account for different spelling;
2 Restriction of the results to the relevant research areas;
3 Pre-selection of seemingly relevant publications based on titles and abstracts;
4 Accessing publication quality based on pre-selection of publications from the journals within first quartile in scimago journal rank;
5 In the case if the source is not indexed by scimago or belongs to the lower quartile, assessing publication quality individually (How relevant are results? Is method described precisely enough, so that validity and reliability of results can be assessed?) Publication, that scored positively on these criteria have been included into review.
6 For all included publications: paper is either empirical or it does propose conceptual framework or model that significantly contributes to better understanding and organisation of empirical findings.

Table 69 documents selection procedure for the systematic literature review.

Table 69 – Selection procedure for the systematic literature review

	WoS	Scopus	Total
Found Total (Articles)	602 (421)	654 (396)	1256 (817)
Within selected areas	316	459	775
Duplicates	1	0	1
Without duplicates	315	459	774
Merged results			
Automatically found duplicates	602		
Manually found duplicates	10		
Results	644		
Selected for final review	114		

Source: own elaboration

Table 70 – Initial body of articles for qualitative analysis

Geographical coverage	Nr. of articles	Selected articles	Nr. of regions*
UK	5	Peck et al., (2013) Pugh, (2014) Pugh, (2018) Marlow & Richardson, (2016) Henderson, D. (2020)	
Malta	2	Georghiou et al., (2014) McMillan et al., (2016)	
Lithuania	4	Kuleševičiute & Rybakovas, (2015) Paliokaite, Martinaitis & Reimeris, (2015) Paliokaitė, Martinaitis & Sarpong, (2016) Reimeris, (2016)	
Portugal	1	Cooke, (2016)	
Romania	2	Healy, (2016) Ranga, (2018)	
Croatia	2	Bečić & Švarc, (2015) Bačić & Aralica, (2017)	
France	1	Gadille & Siarheyeva, (2014)	
Germany	4	Clar & Sautter, (2014) Kroll et al., (2016) Vlčková, Kaspříková & Vlčková, 2018 Rehfeld and Terstriep (2019)	
Poland	5	Mieszkowski & Kardas, (2015) Bański & Mazurek, (2018) Oleksiuk, (2018) Nazarczuk, Umiński, & Gawlikowska-Hueckel, (2018) Klincewicz, (2018)	
Greece	3	Santini et al., (2016) Chrysomallidis & Tsakanikas, (2017) Papamichail, Rosiello & Wield, (2019)	
Spain	2	Estensoro & Larrea, (2016) Morgan, K. (2016)	
Italy	4	Iacobucci & Guzzini, (2016) Fabbri, (2016) D'Adda et al., (2019a) D'Adda et al., (2019b)	
Slovenia	1	Gebhardt & Stanovnik, (2016)	
Finland	2	Piekkola, (2018) Nordberg, (2015)	
Sweden	1	Kempton, L. (2015)	
Hungary	1	Lengyel, Lukovics & Imreh, (2016)	
Multi-case studies			
		Komninos, Musyck, & Reid, (2014)	

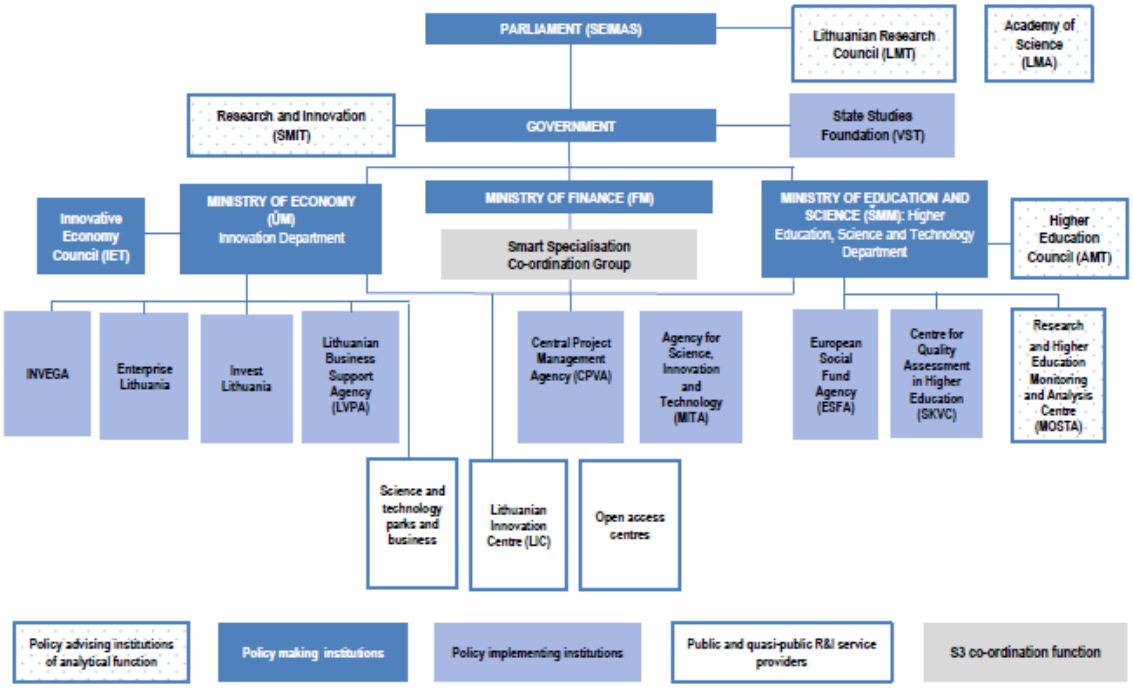
		Kroll, (2015)	
		McCann & Ortega-Argilés, (2016b)	
		Kleibrink, Gianelle & Doussineau, (2016)	
		Capello & Lenzi, (2016)	
		Morgan, (2017)	
		Mäenpää & Teräs, (2018)	
		Uyarra, Marzocchi & Sorvik, (2018)	
		Trippl, Zukauskaite & Healy, (2019)	
		Serbanica & Constantin, (2017)	
		Vallance et al., (2018)	
		Květoň & Blažek, (2018)	
		Sörvik et al., (2018)	
Lower-Austria, South Tirol, Slovenia, Croatia		Benner, (2019)	4 Reg.
Germany (Bremen), Spain (Navarre), France (PACA), Sweden (Scania), Italy (Basilicata), Hungary (Eszak Alfold), Romania (North East), Slovenia		Aranguren, Magro, Navarro & Wilson (2019)	8 Reg.

Source: own elaboration

* - provided only for qualitative/ descriptive studies.

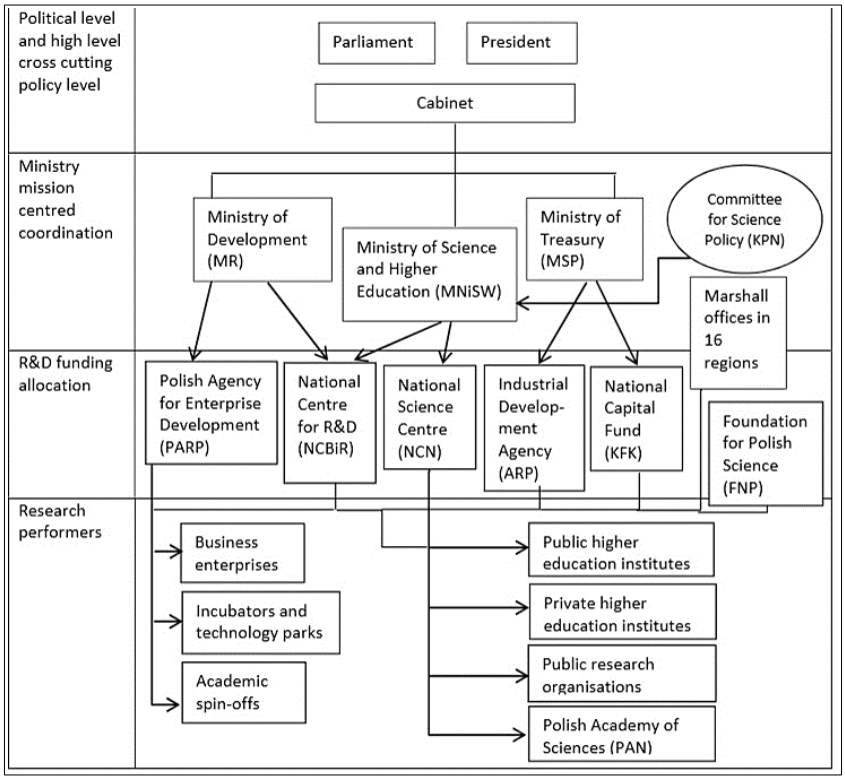
Appendix 2 – R&I system governance structures

Figure 14 – Lithuanian research and innovation system governance structure (as of 2015)



Source: OECD, 2016 p. 127; Paliokaite, 2015, p. 3.

Figure 15 – Polish research and innovation system governance structure (as of 2015)



Source: Klincewicz & Szkuta, 2016, p. 20.

Appendix 3 – S3 assessment wheel

Smart specialisation guide (European Commision, 2012) provides six steps that should be accomplished while designing S3. How well each step has been addressed may be evaluated based on the reflection upon specific dimensions, elaborated in the guide. *S3 Assessment Wheel* is a tool at the S3 Platform, which allows regions to position themselves across different dimensions of the steps distinguished in the guide and evaluate their performance. As noted on the S3 Platform (n.d.) on the *S3 Assessment Wheel*:

"The scaling tool (from 0 to 5) estimates the seriousness of the evidence provided in the process as far as each critical factor is concerned with the following meaning:

0 = no information available on the specific element
1 = poor
2 = to be improved
3 = fair
4 = strong
5 = excellent".

Table 71 – S3 Assessment Wheel

RIS3 Guide Steps	Sections	RIS3 Guide reference	Short explanatory
STEP 1 ANALYSIS OF REGIONAL / NATIONAL CONTEXT	Regional / National Assets	Step 1 (page 18) + Annex I (pages 28-33)	- regional / national assets' endowment - SWOT - innovation potential & skills for knowledge based development
	Outward Dimension	Step 1 (page 19) + Annex I (pages 28-33)	- connectivity - knowledge, trade & skills flows - positioning in trans-regional and international value chains - trans-regional/international collaboration networks
	Entreprenurial Dynamics	Step 1 (page 20) + Annex I (pages 28-33)	- start-ups, clusters, entrepreneurial networks - FDI - new forms of self-employment, etc.
STEP 2 GOVERNANCE	Governance Structures	Step 2 (page 21) + Annex I (pages 34-44)	- identification of specific bodies and definition of their tasks, roles and responsibilities
	Broad Participation		- interactive, consensus-based application of collaborative leadership principles - quadruple helix actors (involvement of boundary spanners)
	Management & Communication		- use of open forum discussion and citizen dialogue - e-governance
STEP 3 SHARED VISION	Broad View of Innovation	Step 3 (page 22) + Annex I (pages 45-50)	- are social, organisational, service and market innovation considered beside technological and science based innovation?
	Grand Challenges		- societal inclusive, environmental and sustainable economic development
	Scenario Analysis		- risk assessment and contingency plan for possible future changes

RIS3 Guide Steps	Sections	RIS3 Guide reference	Short explanatory
STEP 4 IDENTIFICATION OF PRIORITIES	Revision of Past Priorities	Step 4 (page 22) + Annex I (pages 51-52)	- critical revision of past experiences (from RIS to RIS3) - dynamic identification of actual or potential areas with competitive advantages
	Consistency		- alignment with context analysis and harvesting of entrepreneurial discoveries and DAE
	Critical Mass		- concentration of resources to the limited number of priorities
STEP 5 POLICY MIX	Roadmap	Step 5 (page 23) + Annex I (pages 53-58)	- including action plan and pilot projects
	Balance		- appropriate mix of targeted and horizontal measures
	Framework Conditions		- e.g. allowing for support to experimentation, etc.
STEP 6 MONITORING & EVALUATION	Output & Result Indicators	Step 6 (pages 24-25) + Annex I (pages 59-64)	- selection of a limited number of output & result Indicators linked to priorities with clearly identified baselines and targets - mechanisms, supported by appropriate data collection, to verify how the activities in the RIS3 are delivering the output and result targets - revision of priorities and policy mix as a result of the monitoring exercise
	Monitoring		
	RIS3 Update		

Source: reprinted from S3 Platform, n.d., https://s3platform-legacy.jrc.ec.europa.eu/ris3-assessment-wheel

Appendix 4 – Evolution of priorities in LT and PL

Table 72 – Development of prioritisation in Lithuania

First Version	Version 2020
Energy and sustainable environment 1. Smart energy systems (smart generators, grids and consumers energy efficiency, diagnostics, monitoring, accounting and management systems) 2. Power generation from biomass (power and fuel production from biomass or waste, waste processing, storage and disposal) 3. Digital Construction (technology for building and operating smart low-energy buildings - digital construction) 4. Solar energy (solar installations and their use for electricity, heat and cooling production technologies)	**Energy and sustainable environment** 1. Enhancing interoperability of distributed and centrally generated, grid and energy efficient systems; 2. meeting the needs of existing and new end-users, enhancing energy efficiency and awareness; 3. development of renewable biomass and solar energy and waste recycling.
Health Technology and Biotechnology 5. Molecular Technology (Molecular Technology for Medicine and Biopharmacy) 6. Public Health (Advanced Applied Technologies for Personal and Public Health) 7. Medical Engineering (Advanced Medical Engineering for Early Diagnosis and Treatment)	**Health Technology and Biotechnology** 4. Molecular technology for medicine and biopharmacy; 5. Advanced applied technologies for personal and public health; 6. advanced medical engineering for early diagnosis and treatment.
Agro-innovation and food technology 8. Safer food (sustainable agrobiological resources and safer food) 9. Functional Food (Functional Food) 10. Bio-raw material development (innovative bio-raw material development, development and processing (biorefining))	**Agro-innovation and food technology** 7. sustainable agrobiological resources and safe food; 8.Waste-free processing of bio-raw materials into valuable components.
New manufacturing processes, materials and technologies 11. Laser technology (photonic and laser technology) 12. Functional materials (functional materials and coatings) 13. Structural materials (structural and composite materials) 14. Flexible systems (flexible product development and production technology systems)	**New manufacturing processes, materials and technologies** 9. photonic and laser technologies; 10. Advanced materials and structures; 11. flexible product development and production technologies.
Transport, Logistics and Information Communication Technologies 15. Transport and ICT systems (Intelligent Transport Systems and ICT) 16. Transport corridors (management of international transport corridors and integration of transport modes) technologies and models) 17. Electronic content (advanced electronic content, technologies for creating it and informational content) interaction) 18. Cloud computing (ICT infrastructures, cloud computing solutions and services)	**Smart, clean, connected transport** 12. Intelligent Transport Systems; 13. technologies (models) for international corridor management and intermodal integration.

	Information and Communication Technologies 14. artificial intelligence, big and distributed data; 15. Internet of Things; 16. multimodal analysis, processing and deployment; 17. cyber security; 18. financial technology and blockchains.
Inclusive and creative society 19. Educational technologies (modern educational technologies and processes that stimulate and becoming a creative and productive personality) 20. Breakthrough innovations (technologies and processes for creating and deploying breakthrough innovations)	**Inclusive and creative society** 19. modern educational technologies and processes; 20. design and audiovisual media technologies and products; 21. social and cultural innovation for the development of societal development products and services, innovative business models; 22. flexible and applied process control technologies.

Source: own compilation from Visionary Analytics, 2013a, p. 6; STRATA, n.d.-d; European Commission, n.d.-d.

Table 73 – Development of prioritisation in Poland (national level)

First Version	Version 2020
HEALTHY SOCIETY 1. Medical engineering technologies, including medical biotechnologies 2. Diagnosis and therapy of lifestyle diseases and in personalized medicine 3. Manufacture of medicinal products	**HEALTHY SOCIETY** 1. Healthy society
AGRICULTURAL AND FOOD BIOLOGY, FORESTRY AND WOOD AND ENVIRONMENTAL 4. Innovative technologies, processes and products of the agri-food and forestry-wood sector 5. Healthy food (high quality and ecological production) 6. Biotechnology processes and products of specialized chemistry and environmental engineering	**AGRICULTURAL AND FOOD BIOLOGY, FORESTRY AND WOOD AND ENVIRONMENTAL BIOLOGY** 2. Innovative technologies, processes and products of the agri-food and forestry-wood sector 3. Biotechnology and chemical processes, bioproducts and products of specialized chemistry and environmental engineering
SUSTAINABLE ENERGY 7. Highly efficient, low-emission and integrated systems for manufacturing and storage, energy transmission and distribution 8. Intelligent and energy-saving construction 9. Environmentally friendly transport solutions	**SUSTAINABLE ENERGY** 4. High-efficiency, low-carbon and integrated systems for generation, storage, transmission and distribution of energy 5. Intelligent and energy-saving construction 6. Environmentally friendly transport solutions
NATURAL RAW MATERIALS AND WASTE MANAGEMENT 10. Modern technologies for obtaining, processing and using natural raw materials and the production of their substitutes 11. Minimizing waste generation, including waste that cannot be processed and material and energy use of waste (recycling and other recovery methods) 12. Innovative technologies for processing and recovering water and reducing its consumption	**Circular ECONOMY - WATER, FOSSIL RAW MATERIALS, WASTE** 7. Circular economy - water, fossil raw materials, waste

INNOVATIVE TECHNOLOGIES AND INDUSTRIAL PROCESSES (HORIZONTAL) 13. Multifunctional materials and composites with advanced properties, including nanoprocesses and nanoproducts 14. Sensors (including biosensors) and intelligent sensor networks 15. Intelligent networks and geoinformation technologies 16. Electronics based on conductive polymers 17. Automation and robotics of technological processes 18. Optoelectronic systems and materials	**INNOVATIVE TECHNOLOGIES AND INDUSTRIAL PROCESSES (HORIZONTAL)** 8. Multifunctional materials and composites with advanced properties, including nanoprocesses and nanoproducts 9. Electronics and photonics 10. Intelligent networks and information and communication technologies as well as geoinformation 11. *Printed, organic and flexible electronics** 12. Automation and robotics of technological processes 13. Intelligent creative technologies 14. Innovative marine technologies in the field of specialized vessels, marine and coastal constructions as well as logistics based on maritime and inland transport

Source: own compilation from Ministerstwo Gospodarki, 2014, pp. 33-34; Ministerstwo Rozwoju, 2020, p. 27; European Commission, n.d.-d

** - After an update, the specialisation is not present on the list, valid from 17 January 2022 (version 8 of the national smart specialisation priorities).*

Appendix 5 – Support measures in Lithuania and Poland

Note: In Lithuania, public support for S3 is funded with ESIF. In Poland, national funding across support measures is also available, but ESIF makes up the major share.

Table 74 – Support measures in Lithuania (2014-2020)

Priority for support (ESIF, planned budget)	Support measures
Promoting the use of existing and new RDI infrastructure (197 mln EUR)	1 STED (Science, Technology, and experimental development) Infrastructure development and integration into European infrastructures; 2 Developing centres of competence
Enhancing the intensiveness of RDI activities in the private sector (298 mln EUR)	1 Technoinvestas 2 Inogeb LT 3 Inoklaster LT 4 Inopatentas LT 5 SmartParkas LT 6 SmartInvest LT 7 SmartInvest LT+ 8 Intelektas. Bendri mokslo-verslo projektai 9 Inovaciniai cekiai (eng. Checks for innovation) 10 Inoconnect 11 Ikiprekybinai pirkimai LT (eng. Pre-commercial procurement)
Enhancing knowledge commercialisation and technology transfer (156 mln EUR)	1 Incentives for commercialisation and internationalisation of STED results 2 Targeted scientific research in the smart specialisation domain 3 Joint science and business projects 4 Incentives for developing activities of the centres of competence and technology transfer centres
Strengthening skills and capacities of the public research sector (114 mln EUR)	1 Enhancing qualification of scientists and researchers in the knowledge-intensive enterprises 2 strengthening capabilities of scientists and other researchers 3 Enhancing competences of scientists, other researchers and students through scientific practice activity 4 Incentives for commercialisation of STED results and internationalisation

Source: own compilation from Visionary Analytics, 2017, p. 2.

Table 75 – Support measures in Poland (national level) (2014-2020)

Priority for support (ESIF, planned budget) *(planned national budget)*	Support measures
Support for R&D activity of enterprises (3,85 mld EUR) *(707 mln EUR)*	1 Enterprise R&D projects ◦ Industrial research and experimental development by enterprises ◦ development of the experimental prototypes and pilot installations 2 Sectoral R&D programmes

	3 R&D financed with capital fund participation ◦ Support for R&D projects in preseed phase by proof of funds concept - BRIdge AlfaPublic ◦ Support for R&D with the participation of venture capital funds - BRIdge VC
Support for the environment and capacity of enterprise for R&D&I activity (1,04 mld EUR) *(191 mln EUR)*	1 Support for investments in business R&D infrastructure 2 Open innovation – support for technology transfer ◦ Component 1: creating a technology bank, including patents and unpatented technical knowledge ◦ Component 2: Financial instrument for acquisition of intellectual property rights 3 Pro-innovative services for enterprises ◦ Pro-innovative services of business environment institutions for SMEs ◦ Innovation vouchers for SMEs ◦ Internationalization of National Key Clusters ◦ Industrial property protection ◦ Design for entrepreneurs ◦ Acceleration programmes 4 Cooperation within the national innovation system ◦ Analysis and pilot projects for new instruments (inno_LAB) ◦ Monitoring of the National Smart Specialization 5 Acceleration programmes 6 Project of the Patent Office of the Republic of Poland
Support for innovation in enterprises (2,2 mld EUR) *(429 mln EUR)*	1 Financing innovative activities of SMEs with use of risk capital ◦ Investments in innovative start-ups – Starter ◦ Group investments of business angels in SMEs – BizNest ◦ Innovation Loan Fund ◦ KOFFI - Competitive National Fund of Innovation Funds ◦ Support for SMEs in access to the capital market - 4 Stock 2 Support for the implementation of R&D results ◦ Research to market ◦ Loan for technological innovations ◦ Guarantee fund for support of innovative enterprises 3 Promotion and support for internationalization of innovative enterprises ◦ Polish Technological Bridges ◦ Promotion of the economy based on Polish product brands - Brand of the Polish Economy – Brand ◦ Support for SMEs in the promotion of product brands – Go to Brand
Increasing scientific and research potential (1,22 mld EUR) *(222 mln EUR)*	1 Scientific research and development ◦ Strategic research programmes for the economy ◦ Regional research and development agendas ◦ Innovative research management methods ◦ Application projects 2 Development of modern research infrastructure in science sector 3 International Research Agendas 4 Increasing the human potential of the R&D sector

Source: own compilation from POIR, 2018; Ministerstwo Rozwoju, 2020, p.12.

Appendix 6 – Clusters' thematic specialisations

Note: The data for Lithuania and Poland, presented in this appendix are not directly comparable because of the different methodologies, applied in the original sources and different definition of cluster.

Table 76 – Distribution of clusters throughout economic activities (NACE codes)

Economic activity	**Number of clusters**
Unspecified	5
Other service activities	28
Arts, entertainment and recreation activities	10
Human health care and social work	5
Education	30
Administrative and service activities	14
Professional, scientific and technical activities	37
Real estate operations	14
Finance and insurance	1
ICT	30
Accommodation and catering	8
Transport and storage	7
Wholesale and retail; repair of motor vehicles	32
Construction	10
Water supply and waste management	2
Electricity, gas, steam and air conditioning supply	4
Manufacturing	32
Mining and quarrying	1
Agriculture, forestry and fisheries	2

Source: own elaboration, based on Vaiginienė, Nausėdaitė & Mažeikaitė, 2019, p. 25.

Table 77 – Economic specialisation and sectors of clusters in Poland (PARP data)

Economic activity/ sector	**Clusters**	**Cluster initiatives**
Printing and publishing	2	2
Creative industries	3	6
Transport and logistics	3	3
Aviation	4	2
Chemicals, fertilizers, plastics	4	1
Environmental Protection	4	4
Food industry	5	9
Metal industry	9	5
Business services, education	9	9
Tourism, entertainment, recreation, culture	9	12
Medicine, biomedicine, medical tourism	11	5
Construction (and architecture)	12	6
Energy, renewable energy	16	9
ICT	19	13
Other	8	
Rescue, civil protection, security	2	
Photonics, optoelectronics	2	
Municipal economy, waste management	2	
Natural resources	2	
Biotechnology	2	
Production technologies	6	
Space industry		1
Household appliances		1
Maritime economy		1
Social sector		2
Trade/Retail		2
Furniture		2
Pharmaceuticals, cosmetics		2
Machinery		2
Wood industry		3
Automotive industry		4

Source: own elaboration, based on Buczyńska et al., 2016, p. 35, p. 55.

Appendix 7 – Anonymised list of interviewees

Interviewee's code:
Number + country code + stakeholder code

Country codes: I – international (countries other than Lithuania or Poland); LT – Lithuania; PL – Poland

Stakeholder codes:
F – facilitation (people with different background, had a role of advisors, consultants, facilitators);
BS – boundary spanners (people with experience in different helices);
NG – national-level government sector (e.g., ministries, implementing agencies);
RG – regional-level government sector (regional authorities);
B – business (business stakeholders engaged in S3);
S – science (science stakeholders engaged in S3);

Table 78 – Summary of conducted interviews and characteristics of interviewees

Code	Stakeholder	Type of organisation	Position	Country	Mode	Date	Duration (h:min)	T
1-F-I	EU level	Research & Facilitation	Expert	Int.	(Skype)	01/03/17	1:31	T[1]
2-BS-PL	Government & (Science)	National level & University	Expert	PL	(F-t-F)	09/12/16	0:58	T
3-NG-PL	Government	National level	Head of Department	PL	(F-t-F)	31/03/17	0:51	T
4-NG-PL	Government	National level	Director	PL	(F-t-F)	25/04/19	0:46	T
5-NG-PL	Government	National level	Expert, Project coordinator	PL	(F-t-F)	29/07/19	1:06	T
6-RG-PL	Government	Regional authority	Head of Department	PL	(F-t-F)	24/05/17	0:55	T
7-RG-PL	Government	Regional authority	Associate director	PL	(F-t-F)	02/10/19	0:57	T
8-RG-PL	Government	Regional authority	Director	PL	(F-t-F)	04/10/19	0:56	T
9-RG-PL	Government	Regional authority	Expert, Coordinator	PL	(Phone)	21/11/19	0:50	T
10-RG-PL	Government	Regional authority	Director	PL	(F-t-F)	29/11/19	0:57	T
11-RG-PL	Government	Regional authority	Associate director	PL	(F-t-F)	18/12/19	0:56	T
12-RG-PL	Government	Regional Authority	Director, Expert	PL	(Zoom)	23/09/20	1:18	T
13-RG-PL	Government	Regional Authority	Expert, Head of the Unit	PL	(Zoom)	24/09/20	1:06	T
14-BS-PL	Science & Business & Government	Multilevel (national/international)	Director	PL	Zoom	02/10/2020	0:46	T
15-BS-PL	Business & Science	Business asociation, University	Independent Expert	PL	Phone	02/10/2020	0:41	T
16-BS-PL	Business & Government &	Entrepreneur, National level government	Independent Expert	PL	Zoom	09/10/2020	1:02	T

	Science	Independent						
17-NG-PL	Government	National level	Director, Expert	PL	Zoom	15/10/20	1:07	T
18-RG-PL	Government	Multilevel (Regional/International)	Expert	PL	Zoom	21/10/20	0:25	T
19-F-PL	Facilitator & Science	Consulting/ University	Expert	PL	Zoom	26/10/20	1:03	T
20-F-PL	Facilitator & Science	University	Expert	PL	Zoom	26/10/20	0:51	T
21-BS-PL	Business & Science	Business Association/ University	Expert	PL	Zoom	29/10/20	0:59	T
22-F-LT	Facilitator	Consulting	Expet	LT	(F-t-F)	22/03/18	1:11	T
23-NG-LT	Government	National	Managing director	LT	(F-t-F)	09/05/17	0:37	T
24-NG-LT	Government	National	Director	LT	(F-t-F)	07/11/19	1:26	T
25-NG-LT	Government	National	Director	LT	(F-t-F)	07/11/19	0:50	T
26-NG-LT	Government	National	Head of Division	LT	(F-t-F)	12/11/19	0:57	T
27-S-LT	Science	University	Expert	LT	(Skype)	14/05/18	1:09	T
28-S-LT	Science	University	Expert	LT	(F-t-F)	17/05/18	1:15	T[2]
29-BS-LT	Science & Business	Intermediary	Director	LT	(Zoom)	21/08/20	1:02	T
30-B-LT	Business	Photonics industry	Director	LT	(Zoom)	25/08/20	0:59	T
31-NG-LT	Government	National	Head of the Unit	LT	(Skype)	02/09/20	0:41	T
32-NG-LT	Government	National	Analyst	LT	(Zoom)	03/09/20	0:40	T
33-NG-LT	Government	National	Analyst	LT	(Zoom)	18/09/20	0:59	T
34-B-LT	Business	ICT industry	Expert, Project Manager	LT	(Zoom)	25/09/20	1:05	T
35-BS-LT	Business (+Science & Government)	Intermediary	Director	LT	(Zoom)	07/10/20	0:47	T
36-NG-LT	Government	National	Director	LT	(Zoom)	15/10/20	1:04	T
37-BS-LT	Business (+Government)	Consulting	Expert	LT	(Zoom)	17/10/20	0:58	T
38-NG-LT	Government	National	Director	LT	(Zoom)	27/10/20	0:44	T

Source: own elaboration

T[1] – transcript revised by interviewee
T[2] - ~22 first minutes of the interview have not been recorded due to technical problems, but notes have been taken during the interview, rest of the interview recorded completely (recorded part: 0h 52min)

Appendix 8 – Tools for theory development: Codebook

Reinforcement Changing attitudes *Code refers to the change in attitudes to the concept or specific S3 related practices as the concept itself and S3 process evolve* Changing context *Changes in context and preconditions for S3* Changing focus *The code denotes changing focus between different sectors (in sense group of stakeholders)* Concept travels *The code refers to the reinforcement of the concept between different groups of stakeholders or levels of discussion* Evolving discourse *discourse around the concept* Levels of detail *The code reflects the depth of reinforcement: different levels of detail as the concept moves from strategical towards operational level.* Good practices *what is considered as a good practice*

Challenges Organisational capacity *challenges, related to organisational capacity of the policy-makers* Ownership related *challenges, that relate to the ownership of the strategy* Participation-related *Challenges, related to stakeholders participation in the process* Political aspects *possible impacts of political aspects and situation on S3* Possible EDP failures *occurrence or magnitude of possible effects due to specific approach* Innovation capacity *challenges, related to innovativeness of the firms and capacity to absorb funds* Fears *fears and scepticism of different stakeholders*

Effects of S3 Consolidation *Effects on S3 on consolidation, e.g., funds, domains etc.* Cooperation between stakeholders *cooperation between different groups of stakeholders* Differences in approaches *denotes differences between previous and current perspective* Effects on inter-firm cooperation *Reflects effects of S3 on the cooperation of firms* Measuring effects *issues related to measurement of the effects* Official S3 strategy *perceived role of S3 document and its content* Outcome determinants *what conditions determine outcomes of S3 with regard to its different aspects* S3 vs previous perspective *Comparison of S3 to the previous approach* System alignment *effects of S3 on the system as a whole, e.g., reducing or increasing fragmentation, reducing adding bureaucracy ect.* Effects on multilevel governance *effects of S3 on the relationship between different level of government* Change in perception *changes in perception on innovation related themes*

Governance structure Aligning administrative level *issues and challenges, related to the structure of administrative level and its impact on S3 governance* Balancing influence *The code reflects issue, relating to the achievement of balance between the sectors and players, involved in S3.* Multilevel governance *Reflects multilevel governance structure, e.g., national and regional level* Reasons for structure choice Relations between steps of S3 *relations between different steps of S3, such as e.g., priority setting, implementation, monitoring ect.* Setting governance structure *The code denotes assigning responsibilities and tasks to particular organisations or bodies, involved in the S3 process* Sectoral dimension in governance *Reflection of sectoral differences in the governance structure*

Implementation Designing tools *what affects design of the tools, e.g., operational programmes* Feedback issues *possibilities and challenges involving relevant stakeholders into the process of design of operational programmes/ implementation tools* Implementation start *how implementation started* Tailoring tools *whether or not tools should by tailored to specific specialisations* Tool testing *initiatives, related to testing of tools* Tools *programmes and documents relevant for implementation of S3* Use of tools *what tools are popular by particular applicants* Project selection *how the projects are selected* Managing priorities *refers to the need o manage priorities or to the need of leadership* Application procedures *E.g., requirements, documentation, bureaucratic procedures etc.*

Initialising S3 Channelling EDP *refers to initial pre-selection of priority fields, setting participation criteria etc.* Coercive influence *The code denotes that some actions had to be undertaken just because strategies won't be accepted otherwise.* Foundations *The code denotes points of departure for the S3 process in a member state or a region and refers to the initial steps, testing of different approaches or the documents and data that served as a firs building blocks for S3.* Heterogeneity of approaches *Code denotes notions about differences in approach across regions or sectors* Setting EDP framework *the code refers to the actions that determine the structure and framework conditions EDP will run under*

Monitoring issues Aspects of monitoring *what aspects should be monitored and what questions monitoring data should answer* Assignment *Project assignment issue to specific specialisation issues, related to interpretation of specific wording or accent setting* Establishing monitoring system *work on establishment of the monitoring system* Interpretation of evidence *issues, related to the interpretation of available evidence* Monitoring challenges *challenges related to establishment of monitoring system* Sources of evidence *where evidence on progress of S3 may come from*

Organising EDP Assigning tasks for different stakeholder *what are different groups of stakeholders expected to do within S3 exercise* Building on the past *S3 build on the past approach, stretching past into the present, continuity* Discovering *how new themes are discovered* Engagement of the

policy makers *relationship off different groups of the policy makers to the S3 process* Helix coalition *triple helix or subsequent helices in relation to S3* Incentives to participate for the business *reasons why business might or might not be willing to participate* Interest-based partnerships *Organising EDP based on interests of specific businesses or other stakeholders* Perception of EDP - participation *how is perceived participation in the S3 exercise of the different stakeholder groups*

Policy learning Defining innovation *what does innovation mean in the context of S3, what is appropriate project* Evolution of the concept *This code reflects the evolution of the concept smart specialisation and changing views regarding initial assumptions* Rationals behind EDP *why to chose participative and bottom up based process like EDP* Sorting and separating *The code refers to the contrasting of different experiences that may be relevant for S3 and assessing what S3 is and what it is not, what is still applicable with what is changing etc.* Supporting tools *Tools, supporting S3 in the regions, facilitating exchange of experiences etc.*

Preconditions for S3 Administrative landscape *policy system, implying public administration actors, involved in S3* Critical mass *Critical mass of innovative firms as precondition for EDP* Innovative firms *What type of firms is perceived as relevant for S3* Interconnectedness *connections within and between sectors* Past experiences *experience from the past that enhances or inhibits S3* Support facilities for the business *existing support for potential innovators* System readiness *how well the system is prepared for the exercise as S3* Teleological approach *view of a region or state as a single entity, acting towards common goal* Vision *vision aspect of s3*

Previous policy Barriers for adaptability to S3 *Reasons why previous approaches cannot be adopted as S3* Previous perspective *approaches in the financial programming perspective 2007-2014* Similar initiatives *The code denotes policy initiatives that may be seen as somewhat similar to S3* Succeeding *Success stories of extant approaches and experiments*

Prioritisation issues Definition of priority *What may be considered as priority and what not?* Discovering vs redefining *sources of priority wording* Interdisciplinarity *Issues for prioritisation from interdisciplinary nature of innovation* Leverage across levels *leveraging priorities across different levels to achieve synergies or complementarities* Measuring specialisation *reflections on how to measure specialisation* Outcome of EDP *Outcomes of first round of the EDP, which is reflected in the lists of officially adopted priorities* Prioritisation bases *on what basis priorities may be defined: horizontal vs vertical, sectoral, technology based etc.* priority selection criteria *criteria that may be applied for selecting priorities* Scope of priority *how broadly are priorities defined* Sectoral dimension in prioritisation *differences in defining priorities across sectors* Markets for innovation *considerations on markets when selecting priorities* Wording *The way priorities are defined in terms of wording*

Respondents info Experience with S3 *Respondents role in S3* Inspirations *inspirations received from respondents for my work* Miscellaneous info *anything that does not directly contain info, relevant for the coding procedure, e.g., lack of answer, redirection to other people etc.*

Sources of inspiration Building on the past approaches *The code reflects S3 development as a continuation on what already have been done in a region.* Developing own approach *The code reflect development of original approaches to S3* Existing practices *practices from existing programmes and policy initiatives* Sediments from the past *The code denotes traces of the past approaches and attain the modern documents. The code name is inspired by the research on sedimentation within fashion theory* Testing approach *pilot projects and initiative to work out EDP* Transfer of experiences *The code reflects attempts to transfer existing experiences to the current setting of S3.* Mimetic influence *code reflects mimetic isomorphism* Normative influence *code refers to normative isomorphic pressure*

Appendix 9 – Tools for theory development: Conditional relationship guide

Table 79 – Conditional relationship guide

Category	What	When	Where	Why	How	Consequences
Reinforcement	Reinforcement can be defined as development of the concept related ideas and their spreading and adoption into different circles and levels of detail; „concept travels”	- Academic discussion - political discussion - development of strategic level; - operationalization	- spacial: among groups of stakeholders, sectors - depth: among levels of detail	- own initiatives - isomorphic pressures: coercion; - good practices? (mimicry or normative isomorphism not visible yet?)	- discourse; - mobilisation (forced)	- changing attitudes - changing context
Challenges	Possible sources of breaks in the S3 process	During different steps of the S3 process	-Organisational capacity - Motivation/ incentives - political aspects - innovation capacity	- cultural aspects - lacking trust - lacking perception of usefulness/sense - lacking experiences - fears and scepticism	- searching alignment between aspiration and reality	- Possible EDP failures (occurrence or magnitude of possible effects due to specific approach)
S3 architecture: Governance structure	- physical structure - power structure - coupling structure	- assigning responsibilities and tasks	- at different levels of government; - between different stakeholder groups; - relations btween steps of S3	- multilevel governance; - reflecting sectoral dimension	- aligning administrative capacities - balancing influence;	- infrastructure for the process: Preconditions for coherence of S3
S3 architecture: Initialising S3	Setting EDP framework, implies possibility to use S3 as a trigger for change or continuity	At the time of emergence of S3 as ex-ante conditionality (eventually also during revision)	- Public administration bodies - empowered expert groups	- coercive influence;	- channelling EDP; - determining foundations;	- heterogeneity of approaches
S3 architecture: Organising EDP	Engagement model for the stakeholders: - e.g., triple helix (or subsequent generation); - interest based	- Organising working groups’ - assigning tasks to different stakeholder	- Working groups	- building on the past; - discovering	Motivation aspects: - Engagement of the policy makers; - Incentives to participate for the business	- Perception of EDP – participation

	partnerships					
Prioritisation issues	Challenges related to priorities	- during the process of priority selection, but also during later steps	- S3 list of priorities	Complexity: - Definition of priority; - Interdisciplinarity; - Prioritisation bases - Scope of priority - Sectoral dimension in prioritisation	- Discovering vs redefining; - Leverage across levels; - priority selection criteria - Measuring specialisation; - Markets for innovation;	Outcome of EDP: Outcomes of first round of the EDP, which is reflected in the lists of officially adopted priorities
Implementation	Challenges related to implementation	- during design of the tools, calls, and project selection	- implementation start; - use of tools;	- tools; - feedback issues; - managing priorities;	- tailoring tools; - tool testing; - project selection;	- application rate; - success rate; - quality of projects
Monitoring issues	Challenges related to monitoring	- when establishing monitoring system - during data collection process	- in the evaluation and monitoring reports; - evidence for strategy updates/ further decision	- sources of evidence; - interpretation of evidence; - Assignment	- aspects of monitoring - establishing monitoring system	- quality of EDP
Determinants of EDP choices: Preconditions for S3	What are preconditions for S3 in terms of substance, infrastructure and mentality	- setting and conducting EDP	- prioritisation and search of opportunities	- path dependency	- reinforcing extant institutions	- system readiness - quality of EDP and its outcomes
Determinants of EDP choices: Previous policy	Extant policy path of the region	- integration of S3 into current policy landscape	- previous perspective; - similar initiatives) (- strategic documents; - governance arrangements; - eventually stakeholder involvement models;)	- path dependency	- succeeding;	- barriers for adaptability to S3 (consequence: failed learning or supporting policies?)
Determinants of EDP choices: Sources of inspiration	What inspires Mix of influences on the S3 process design and EDP: - past approaches; - new developments	During design and implementation of EDP	Within relevant expert groups, policy makers, decision bodies	Balancing coercive pressure with own context	- designing guidelines/ methodological approach; - testing new approachers, tools; - integrating extant approaches/	Depending on the constellation, improvement of policy making practices or organised hypocrisy and façades

	and experimentation; - isomorphic pressures (mimetic, normative)				tools into current exercise	
Effects of S3	Types of effects: - institutional environment and governance; - economic effects; - cultural effects (perceptions)	Effects emerge as the process evolves	Different groups of stakeholders	Mixture of antecedents and coercion	Through appropriate change mechanisms: organisation of EDP and tailored implementation tools	Success or failure of S3
Policy learning	Negotiating definition of innovation and appropriate policy to support it	Process of S3	Policy-makers (but possibly also other stakeholders)	Need to align interests	Discussion; trial and error	Improve policy making (build façades)

Source: own elaboration

Appendix 10 – Tools for theory development: Reflective Coding Matrix

Table 80 – Reflective coding matrix

Core category	Discontinuities in S3			
Properties	Interpretation clash	Architecture deficits	Process (trapped)	Modification
Processes	Amplification of frame through reinforcement: "concept travels"	Assigning tasks and responsibilities	Aligning logics	Negotiating definition of innovation and appropriate policy to support it
Dimensions	**Levels:** - Academic discussion - political discussion - development of strategic level; - operationalisation **Drivers:** - own initiatives - isomorphic pressures: coercion; - good practices? (mimicry or normative isomorphism not visible yet?) **Means:** - discourse; - mobilisation (forced?)	- multilevel governance; - reflecting sectoral dimension - aligning administrative capacities - balancing influence; - coercive influence; - channelling EDP; - determining foundations; - building on the past; - discovering Motivation aspects: - Engagement of the policy makers; - Incentives to participate for the business	**Potential risk sources:** -Organisational capacity - Motivation/ incentives - political aspects - innovation capacity **Potential triggers:** - cultural aspects - lacking trust - lacking perception of usefulness/sense - lacking experiences - fears and scepticism	- reinforcing extant institutions - succeeding; - designing guidelines/ methodological approach; - testing new approaches, tools; - integrating extant approaches/ tools into current exercise - Mixture of antecedents and coercion
Contexts	**Spacial**: - among groups of stakeholders, sectors **Depth**: - among levels of detail	**Types of structures:** - physical structure - power structure - coupling structure	**Within steps:** **Prioritisation** Complexity: - Definition of priority; - Interdisciplinarity; - Prioritisation bases - Scope of priority - Sectoral dimension in prioritisation **Implementation** - tools; - feedback issues; - managing priorities; **Monitoring** - sources of evidence; - interpretation of evidence;	**Types of effects:** - institutional environment and governance; - economic effects; - cultural effects (perceptions)

			- Assignment **Between steps:** Operationalising consistency – movement between levels and steps	
Modes of understanding the consequences	- changing attitudes - changing context	- path dependence	Translation failure	Power relations

Source: own elaboration

Appendix 11 – S3 monitoring in Poland (national level)

Table 81 – Evaluation plan: Monitoring of National Smart Specialisation (Poland)

	2017	2018	2019	2020	2021	2022	2023
Ex-ante evaluation	+						
Semiotic analysis of "smart specialisation" and related terms	+	+					
Assessment of the internationalisation of domestic enterprises in KIS areas	+	+	+				
The effectiveness and adequacy assessment of the selection systems and selection criteria of OP projects concerning the implementation of the goals of S3 (KIS and RIS) – methodology and Phase I study		+	+				
Assessment of the science sector's impact on the achievement of KIS objectives		+	+				
Mid-term evaluation			+				
Evaluation of 16 Regional Innovation Systems			+	+			
Analysis of the business environment institutions' potential and their impact on the achievement of KIS objectives			+	+			
International comparison of economic and technological specialisation monitoring systems - peer review in the EU and OECD (reserve study)			+	+			
Input-output analysis (methodology)					+		
Analyses of the net effects of public intervention in the areas of KIS					+	+	
The effectiveness and adequacy assessment of the selection systems and selection criteria of OP projects concerning the implementation of the goals of S3 (KIS and RIS) – Phase II study					+	+	
Analysis of global and regional input-output flows (continued)						+	+
Analyses of network relations in the smart specialisation ecosystem, key actors in the national and regional S3						+	+
Ex-post evaluation							+

Source: own elaboration based on PARP, 2017, p.14.

Table 82 – Published S3 monitoring reports in Poland*

	Analyses in the field of national smart specialisations (original names)	**Explanatory**	
1	Analiza stanu rozwoju oraz aktualnych trendów rozwojowych w obszarze elektromobilności w Polsce	*Analysis of the state of development and current development trends in the field of electromobility in Poland*	2019
2	Dotychczasowe osiągnięcia (tzw. success stories) w obszarach krajowych inteligentnych specjalizacji (MRPiT)	*Success stories in the areas of national smart specialisation*	12.2020
3	Aktywność technologiczna, innowacyjna i	*Technological, innovative and business*	04.2020

	biznesowa przedsiębiorstw działających w ramach krajowych inteligentnych specjalizacji (MRPiT)	*activity of enterprises operating under national smart specialisations*	
	Expert analyses within EDP - Business Technology Roadmaps (12 analyses)		2018-2019
	Evaluation of the intervention logic within national smart specialisations		
1	Ewaluacja ex-ante projektu pozakonkursowego pn. „Monitoring Krajowej Inteligentnej Specjalizacji" Programu Operacyjnego Inteligentny Rozwój 2014-2020	*Ex-ante evaluation*	2017
2	Ewaluacja mid-term projektu pozakonkursowego pn. „Monitoring Krajowej Inteligentnej Specjalizacji" Programu Operacyjnego Inteligentny Rozwój 2014-2020	*Mid-term evaluation*	*10.08.2021***
3	Ewaluacja pierwszych efektów wsparcia PO IR w zakresie prac B+R oraz wdrażania wyników prac B+R realizowanych w przedsiębiorstwach (MFiPR)	*Evaluation of the first effects of the support for the POIR in the field of R&D works and implementation of the results of R&D works carried out in enterprises*	2020
	Thematic evaluations		
1	Analiza semiotyczna pojęcia smart, inteligentne specjalizacje oraz zmieniających się kodów przedsiębiorczości	*Semiotic analysis of "smart specialisation" and related terms*	17.04.2018
2	Benchmarking systemów monitoringu inteligentnych specjalizacji oraz procesu przedsiębiorczego odkrywania (na poziomie regionalnym)	*Benchmarking of smart specialization monitoring systems and entrepreneurial discovery process (regional level)*	*19.04.2021*
3	Benchmarking systemów monitoringu inteligentnych specjalizacji oraz procesu przedsiębiorczego odkrywania (na poziomie międzynarodowym)	*Benchmarking of smart specialization monitoring systems and entrepreneurial discovery process (internationally)*	*19.04.2021*

Source: own elaboration, based on https://smart.gov.pl/pl/analizy-i-raporty

* Table 82 presents the analyses and reports published on the S3 dedicated website. The list is not exhaustive because it does not include studies conducted by different organisations, e.g., NCBR, or documents on monitoring regional S3, which could also be relevant for S3.

** Date in *italic* has been taken from the document "properties", from the field "created on", when thee publication date was not stated in the report.