

# **SISCODE CO-DESIGN FOR SOCIETY IN INNOVATION AND SCIENCE**

## **DELIVERABLE 2.3: COMPARATIVE ANALYSIS REPORT OF CO- CREATION CASE STUDIES AND INNOVATION BIOGRAPHIES**

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## 1. Executive Summary

SISCODE's deliverable D2.3 at hand, the 'Comparative Analysis Report', comprises the presentation of results of the analysis of data from three different sources: the Knowledge Base (SISCODE D2.1), the Co-Creation Case Studies (SISCODE task T2.2) and Co-Creation Innovation Biographies (SISCODE task T2.3), which are available with SISCODE's deliverable D2.2 'Case Studies and Biographies Report' (SISCODE D2.2). Hence, D2.3 presents the results of SISCODES task T2.4 'Comparative Analysis'. The analysis of data from the three different sources was realized in three steps, starting with a comparative analysis of Co-Creation Case Studies, which was followed by a comparative analysis of Co-Creation Innovation Biographies. Results from these two initial steps of analysis were triangulated with results of the Meta-Analysis conducted for SISCODE's Knowledge Base (SISCODE D2.1) as task T2.1.

The presentation of results from the comparative analyses and the triangulation in the deliverable at hand is framed with additional chapters aimed to support understanding of the overall approach by presenting information on the background, context, and analytical framework. Hence, SISCODE's D2.1 starts with an introduction of SISCODE and a brief overview of the report's main aims and the overall approach (chapter 2).

In chapter 3, the overall research design is presented, giving information on the integration of working tasks T2.1-T2.4 in SISCODE's overall analytical approach and with special emphasis on the comparative analysis and the triangulation. Furthermore, chapter 3 comprises a description of the development of co-creation Case Studies for T2.2 and of co-creation innovation Biographies for T2.3 and their integration with task 2.4. In a next sub-chapter, the analytical grid guiding the research for T2.4 is presented with its links to earlier tasks. Besides the main analytical model (the 'ecosystem model'), the sub-chapter on the analytical grid does also introduce important concepts and terms used throughout the whole report. Chapter 3 closes with an explanation of the method employed for analysis: a qualitative content analysis.

Chapters 4 and 5 comprise the presentation of results from the comparative analysis of co-creation Case Studies (chapter 4) and co-creation Biographies (chapter 5), based on the qualitative content analysis. Both chapters feature a comparable structure to support readers interested in comparing results for the different analytical units on their own. This structure is reflecting the analytical grid provided by the ecosystem model.



In chapter 6, the results from the triangulation of results from the comparative analysis of the co-creation Case Studies, the comparative analysis of the co-creation Innovation Biographies, and the Meta-Analysis. Similar to chapters 4 and 5, its structure is also following the analytical grid provided by the ecosystem model.

Chapter 7 comprises a discussion of the results from the analyses presented in chapters 4-6. Bringing together these results from different data sources, it also represents a meta-perspective on these results. Furthermore, it is presenting categorizations derived from the results of the analysis. Chapter 7 closes with final remarks on the lessons learned during the application of the ecosystem model as a main element of the analytical grid.

The last chapter summarizes major findings of task T2.4 and puts special emphasis on the categorizations developed during the analysis. Additionally, it presents implications and suggestions for further research.

## 2. Introduction

SISCODE (Society in Innovation and Science through CO-DEsign – [siscodeproject.eu](http://siscodeproject.eu)) is a three-year EU funded project within the Horizon2020 programme. It aims at exploring the use of co-design to operationalize Responsible Research and Innovation (RRI) relying on knowledge from the investigation of the theoretical background, an analysis of existing cases in Europe and beyond, and finally, the conduction of 10 real-life experimentations. Hence, SISCODE delivers insights and evidence about the practices and landscape of collaborative approaches to problem-solving in order to stimulate openness towards co-creation in Science, Technology and Innovation (STI) Policy Making and RRI. Moreover, SISCODE understands co-creation as a bottom-up and design-driven phenomenon that is flourishing across European contexts like FabLabs, Living Labs, Social Innovation, smart cities, communities and regions. To this end, the project analyses favourable conditions that support an effective introduction, scalability, and replication of co-creation processes and to use this knowledge to cross-fertilise RRI practices and policies.

This report highlights the results of a comparative analysis of SISCODE's main empirical work which consists of a database of 138 European Co-Creation Cases (SISCODE Knowledge Base, short: Knowledge Base) as well as of a qualitative content analysis of the data provided by 40 Co-Creation Case Studies (short: Case Studies) and 15 Co-Creation Innovation Biographies (short: Biographies). This empirical work has been conducted all over Europe to examine ecosystems of co-creation in specific contexts.

In the last decade, Public Engagement (PE) and RRI have emerged as the results of policies and initiatives demanding the early involvement of multiple actors, including citizens, as well as non-expert people (laypersons), in science and innovation. Nevertheless, this early engagement objective faces several difficulties, and PE rarely goes beyond consulting citizens and beneficiaries in the early stages of the innovation process, generically inquiring about their needs. This is because the integration of co-creation in European STI policy and programmes is encountering barriers such as a scarce and diverging understanding of co-creation among researchers and policymakers together with a lack of conceptual knowledge to cope with constraints that hamper co-creation-processes in practice. Against this background, a common goal on the three dimensions of social innovation, PE and RRI as well as STI Policy Making is to identify and empirically prove

effective ways to engage users and beneficiaries in processes for the creation of solutions for pressing societal challenges.

It is SISCODE's overall aim to describe current approaches to co-creation and their surrounding ecosystems in order to better understand the dynamics and outcomes of different forms of integrating society in science and innovation. Consequently, several research efforts are carried out throughout the project in order to elaborate on these contexts of co-creation in specific environments as well as to gain insights into the opportunities these practices can hold and outcomes that can be expected. As abovementioned, the overall aim is to better understand co-creation as a bottom-up and design-driven phenomenon, the following three research questions guide SISCODE's empirical work:

1. Which actors engage for what reasons and in which contexts in co-creation processes?
2. How can the micro-dynamics in co-creation processes be described?
3. Which similarities and differences between co-creation processes in different contexts can be identified?

Following an ecosystem model for social innovation (Pelka & Markmann 2015), we specifically examine context-specific **"roles"** (motivation, objectives, capabilities, and competencies of the protagonists), **"functions"** (management procedures, working styles, governance, methods used for scaling and diffusion), **"structures"** (giving institutions and economic, political and technological imperatives), and **"norms"** (common laws, legal forms of enterprises and the role of public authorities).

The focus of the empirical study is to create a systematic overview of co-creation by comparing diverse initiatives all across Europe as well as by analysing and uncovering transversal and situated approaches and solutions to better understand how co-creation can be effectively applied to further enhance the integration of society in science and innovation. To do so, SISCODE follows a mixed-methods approach to examine co-creation contexts. This includes a quantitative Meta-Analysis of 138 cases (Knowledge Base) as well as 40 Case Studies and 15 Biographies, which are conducted by all European research partners of the project consortium.

First, the quantitative Meta-Analysis of 138 cases, which were collected by 20 multi-sector SISCODE partner institutions, serves as an explorative study of forms and functioning of co-

creation environments and their drivers and barriers within specific contexts. Being part of the Knowledge Base development, it initially describes the landscape and allows a quantitative description based on variables laid out in SISCODE's analytical framework. To guarantee a uniform approach amongst the project partners, also a case selection plan and a list of possible sources (containing e.g. databases from other projects) was developed.

With the basis of the Meta-Analysis, additional desk research, interviews with at least one responsible stakeholder of the environment of research as well as two comparable templates of questions (see explanation of research design for Co-Creation Case Studies and Co-Creation Biographies in D2.2), diverse co-creation practices (in FabLabs, Living Labs, smart cities and regions, social innovation initiatives, creative communities, accelerators and incubators) have been described in Case Studies and Biographies. So secondly, 40 Case Studies all over Europe from diverse cultural, institutional and political backgrounds were selected. To compare these cases, variables were identified, but also their pathway to implementation and the drivers and barriers they faced alongside the theoretical framework (social innovation ecosystem model, see chap. 3.4). The cases unfold specific practices of co-creation, tools used and lessons learned.

Third, out of the 40 Case Studies 15 cases were selected to be further examined as Biographies. Methodologically, these further examinations are based on the method of "Innovation Biographies", that is a methodology designed to study the time-space dynamics of knowledge and ways of knowledge integration within innovation processes (Butzin 2013). The Biographies build directly on the Case Studies and are complemented by further interviews with key informants and stakeholders engaged in the case under scrutiny. For most Biography cases, this included in situ study visits. Furthermore, each Biography provides detailed insights into the complexities and specific biographical dynamics of the single co-creation process.

Concerning the Case Studies and Biographies, it has to be said that they yield comparable contents because they are based on the analytical grid for "ecosystems of co-creation" (see chap. 3.4). For this reason, coding for Case Studies and Biographies has been aligned, meaning that the same code system has been applied to Case Studies and to Biographies using MaxQDA as a qualitative data analysis tool. But for several reasons, sometimes Case Studies gave more detail on certain aspects, and in other cases, the Biographies allowed for a more in-depth analysis. In effect, this means that the comparative analysis of Case Studies (chapter 4) and the comparative analysis of Biographies (chapter 5) partially include similar

explications of the cases, because they are derived from the same co-creation projects, initiatives, and processes. Though, the difference is of course that the Biographies aimed at a more detailed description and analysis of one single co-creation process within the projects and initiatives presented as Case Studies. Even though all authors tried their best to develop the cases according to the analytical grid, certain redundancies between the content given in Cases and Biographies could not be avoided. Hence, these redundancies have to be reflected in the comparative analysis as well.

With reference to all partners involved, most cases were conducted by native speakers in the respective context which allowed improved access and understanding of the cases. But it came also to light that the writing of the Case Studies and Biographies has been a complex task due to the complexity of the processes that are of relevance to the analysis.

Furthermore, also the number of cases to handle was a challenge. But nevertheless, 55 qualitative Cases have been researched, written, coded, and analysed so that in sum, 9 partner organisations have contributed cases. Especially with the help of partners who had in most cases good access to stakeholders and interview partners. These cases finally based on the same template, but each with a unique approach to their Case Study, which sometimes resulted in some difficulties regarding the way in which comparisons are possible.

Despite all that, after analysing the online-survey of 138 cases (Knowledge Base), we found that co-creation processes are of heterogeneous character concerning the number of partners, their level of geographical extension (from local up to worldwide) and the contents they work on. Co-creation is not only a cross-sectoral process, but in many cases, it even involves all four sectors of society (according to the quadruple helix model (government, academia, industry, civil society), see chap. 3.4). Besides this, we can also highlight that important enablers and barriers were single out on all for levels of the social innovation ecosystem model (see chap. 3.4). This has been possible, since partners who contributed in developing the Case Study research matured a deep knowledge about the concerned Case Study, e.g. due to previous research. Furthermore, co-creation seems to decisively rely on personal motivation and high interest of like-minded people and innovative environments - the combination of these two factors is a good starting point for co-creation. Hampering factors are especially an insufficient integration of the user's perspective and a certain degree of inappropriateness in applying tools and instruments supporting co-creation activities, as well as not having enough time for the single steps required in different stages of cooperation. The descriptive analysis from the Knowledge

Base holds various entry points for further examination and lays out the ground for the qualitative empirical work. Thereby, the 40 Case Studies and 15 Biographies illustrate several constellations of partners and the ways they interact as well as management tools and co-creation methods used. Finally, the main features of the ecosystems in which the co-creation cases and processes have unfolded will be examined. Eventually, analysing the 15 Biographies served to deepen the understanding of developmental trajectories and stakeholder interactions in specific innovation processes over time. The findings discussed in this report shall provide new impulses for research on co-creation processes and their contextual specificities. An in-depth understanding of co-creation ecosystems is essential for the development of social innovation in theory and practice and for its contribution to PE and RRI. Moreover, all partners stated that writing up Case Studies and Biographies has been an important learning experience because each case represents in itself a detailed analysis of a specific co-creation project/initiative. It has widened and shaped the perspectives of authors on the complexity of the processes involved.

All cases of the Knowledge Base (SISCODE D2.1) as well as the chosen Case Studies and Biographies (SISCODE D2.2) are beyond that listed in the annex of this report with case title, scope/location and a short description of the co-creation action(s). Moreover, in the further report, we often reference Co-Creation Case Studies (short: Case Studies) and Co-Creation Innovation Biographies (short: Biographies) that are all introduced in a table before the comparative analysis chapter about Cases Studies and Biographies.

### 3. Overall Research Design

In this report, results from SISCODE D2.1 Knowledge Base and 2.2 Compilation of Case Studies and Innovation Biographies will be triangulated and synthesised in a structured and comparative way, leading to the evidence-based refinement and adaption of a first categorisation of co-creation across Europe and its elements, including examples of good practices. The final comparative analysis will lead to a preliminary proposal of a categorisation of different forms of co-creation in diverse contexts, which then will be adapted and refined in work package 5, where drivers and barriers of co-creation in practice will be looked at. In addition, specific scientific publications in direct relation to SISCODE are planned, which will add results from this report with deeper analysis.

Triangulation (Rothbauer 2008) in SISCODE, hence in this report, refers to the application and combination of diverse research methods in the study of co-creation to give robustness and larger reliability to the project's main findings and recommendations. With this triangulation and a comparative analysis of Case Studies and Innovation Biographies, the deliverable at hand presents the results of SISCODE's working task T2.4.

SISCODE's overall methodological approach aims at supporting the development of the project's central outputs, namely:

- Detection of current new trends of co-creation practices in Europe and the development of a sound theoretical approach to analyse and compare them;
- Development of 10 real-life experimentations in co-creation labs that will apply design methodology and tools to conduct research on co-creation dynamics at work in different frameworks;
- Development of models of co-creation ecosystems to be exploited for replication under different cultural, institutional and regulatory contexts and their inherent drivers and barriers;
- Development of a network of co-creation labs for RRI;
- Promotion of prototyping and experimentation as effective design processes for the integration of evidence coming from real co-creation cases early in STI policy design and vice versa; and
- Support of the internal transformation of STI policy-making at a European, national, and regional level through the acquisition of design competences.

The overall project methodology is articulated along three main research lines: (i) Conceptual development and validation; (ii) Exploration, case analysis and comparison; and (iii) Learning from experimentation and prototyping.

The deliverable at hand belongs to the second (ii) main research line: Exploration, case analysis, and comparison. In the following paragraphs, the previous steps from the main research lines i and ii, providing the basis for the comparative analysis of cases and the triangulation of results from the Knowledge Base (see SISCODE D2.1), the Case Studies (see SISCODE D2.2) and the Innovation Biographies (see SISCODE D2.2), are summarized:

### ***i. Conceptual development and validation***

This first research line, finalised after the first six months of the project, focused on desk research and validation and refinement of the conceptual and scientific approach. It included key activities of WP1 to feed WP2 and WP3. In this phase, an intense screening of the state-of-the-art of RRI approaches and methodologies as well as methodological preparations for future work took place (from T1.1 to T1.4). This included all available sources from peer-review papers to project outputs, including policy papers and EC projects within FP7 and H2020 programmes. These activities prepared, validated and further developed the conceptual framework and the overall theoretical, scientific and methodological coherence of all aspects of the project, as initially outlined in sections 1.3.1 of the proposal, and prepared the monitoring instruments of its operationalization in detail. This phase had a service function and informed later steps from WP2 to WP5. Within this context, the project has also drawn on the results of a number of completed and ongoing EU-funded projects (List, see proposal p.16/17).

### ***ii. Exploration and case analysis comparison***

The second SISCODE research line was based on an intensive phase of primary research, supplemented by further field and desk research to understand and compare the current implementation of co-creation in diverse contexts and formats around Europe. This phase has been conducted using three different methods:

- The Meta-Analysis of a large set of co-creation initiatives across Europe supporting the development of the SISCODE co-creation Knowledge Base (see SISCODE D2.1);
- The development of co-creation Case Studies providing SISCODE with an important means of understanding how co-creation is currently implemented and which outcomes it is producing (see SISCODE D2.2); and finally,
- The development of co-creation Biographies aiming at establishing strong synergies between the co-creation contexts, dynamics, and related policies, capturing the mechanisms of interaction among actors throughout the co-creation life cycle (see SISCODE 2.2).



The selection of Case Studies and Biographies has been conducted on a Knowledge Base of projects and initiatives SISCODE has implemented through a Meta-Analysis process (T2.1). The Knowledge Base covers 138 projects and initiatives (see SISCODE D2.1) on the basis of the following criteria:

1. The diverse cultural, institutional and regulatory EU frameworks in which they develop;
2. Their level of maturity along the ideal line of PE that moves from consultation to co-production;
3. Their positioning along the continuum from science to innovation;
4. The different phases of the co-creation lifecycle in which they are at the moment of the analysis (start-up, mature stage, scaled);
5. The kind of societal challenge they tackle and their correspondence with the EU grand societal challenges;
6. The role of science communication on the development of the co-creation process;
7. The representativeness of the different combinations of co-creation contexts, processes, and contents (fab labs, living labs, smart communities, cities and regions, incubators, Public, Private, People Partnerships PPPPs);
8. The quality of materials and documents available for desk research; and
9. Their different ways to tackle value and gender-sensitive issues, social demands, cultural- and other kinds of diversities.

### 3.1. Knowledge Base

In this section, the approach of the Knowledge Base (SISCODE D2.1) is introduced. It is as a major building block of the triangulation presented in the deliverable at hand, as it is providing the results of the Meta-Analysis, which was one part of the data sources. The Meta-Analysis was realized in an earlier step as SISCODE strives to get to know more about co-creation and its potential to be a leading maxim in the fields of policymaking and RRI. Hence, in a first empirical stage, the Knowledge Base was created on co-creation in diverse fields from a broad range of regions and contexts via an online questionnaire. The aim was to collect at least 100 examples. Every SISCODE partner organisation identified at least seven cases by applying the following criteria:

Table 1 Selection criteria for cases collected for the Knowledge Base

A case is an initiative/project/organisation, that:

Mandatory criteria:

1. Follows one or more main principles of co-creation and is defined as a 'case' by the researchers

2. Offers enough data and the potential to be turned into a Case Study

Optional criteria:

3. Follows design principles, either ex- or implicitly
4. Has a special focus on Policy Making and / or RRI

For SISCODE's understanding of 'co-creation' the following working definition applied considering the following main principles:

- Co-creation is a non-linear process that involves multiple actors and stakeholders from different backgrounds.
- Co-creation takes place in the ideation, implementation and assessment of products, services policies and systems with the aim of improving their efficiency and effectiveness, and the satisfaction of those who take part in the process.

When partners chose cases, they also identified whether the case

- Improves/ changes something by applying co-creation
- Involves multiple actors and stakeholders from different sectors
- Offers enough information (or the accessibility of the info) to make a Case Study out of it.

After completing the procedure, 138 examples were collected. Analysing the online-survey of these cases (SISCODE D2.1) we found that co-creation processes are of heterogeneous character concerning the number of partners, the level of action (local up to worldwide) and the contents they work on. Co-creation is not only a cross-sectoral process, but in many cases, it even involves all four sectors of society (according to the quadruple helix model of Carayannis and Campbell 2009: "academia/universities," "industry/business," "state/government" and "media-based and culture-based public" – or: 'civil society'; see chapter 3.4.). Co-creation seems to decisively rely on personal motivation and high interest of like-minded people and innovative environments –the combination of these two factors seemed to be a good starting point for co-creation. Hampering factors found are especially an insufficient integration of the user perspective and a certain inappropriateness of tools and instruments used as well as not having enough time for single steps in different stages of cooperation. The descriptive analysis from the SISCODE Knowledge Base holds various entry points for further examination and lays out the ground for the qualitative empirical work continued for the results presented in the deliverable at hand.

### 3.2. Co-Creation Case Studies

From the collection of the Knowledge Base (SISCODE D2.1), 40 projects have been selected to be developed as Case Studies. The selection is based on the project's representativeness with respect to the criteria used to populate the database. Out of these 40 Case Studies, 15 of them have been further developed in co-creation Biographies based on their representativeness considering also the availability of contacts and organisations to be involved in their development (see below the description of the method to develop the Biographies). All cases of the Knowledge Base as well as the chosen Case Studies and Biographies are listed in the annex of this report, with their case title, their regional scope, and a short description of the co-creation action.

**These Case Studies describe 40 co-creation initiatives across Europe, with a specific focus on their ecosystem's foundation.** Their construction is based on the case study methodology, as a research frame particularly appropriate for examining a «(...) contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident» (Yin 2014), or else to give answers to «how» and «why» research questions within an environment rich with contextual variables. Such a qualitative approach «(...) explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information» (Creswell 2013).

The collection of Case Studies (see SISCODE D2.2) advances the understanding of co-creation aspects of already-known and described cases, by means of deep qualitative desk research (Strauss & Corbin 1990; Denzin & Lincoln 1994). During this research, the SISCODE consortium collected and compared information coming from different sources: scientific publications, non-scientific publications, interviews, or presentations of the initiators, websites of the enterprises, or initiatives among others. The use of multiple sources enabled the exploration of complex situations, allowing for the gathering of multiple perspectives.

### 3.3. Co-creation Biographies

As mentioned above, out of the 40 Case Studies, 15 have been developed as co-creation Biographies, envisaged to deepen SISCODE's understanding of innovation processes, development trajectories, and stakeholder interactions at the micro-level of the single co-creation initiatives. It is important to note that **biographies are not stories of the**

**organization conducting the innovation, but rather of the innovation process itself that occurs in a specific setting of interaction.** Co-creation Biographies are basically an in-depth biographic-interpretative methodology for analysing narratives of participants' experiences in relation to the larger cultural matrix of society (Wengraf 2001). Through the combination of interviewing techniques, network analysis, and triangulation of data from the individual, structural and contextual level, co-creation processes are reconstructed from the first idea to their implementation. While co-creation processes are also described in the Case Studies, the Innovation Biographies provide additional insights by more detailed descriptions. Although originally developed in the context of "economic" innovation (Butzin & Widmaier 2015), the methodology's application to co-creation is seen as a promising approach to fuel the iterative process of theoretically-informed empirical research, empirically-informed theorising and the generation of evidence-based knowledge to be translated into new modes of policy production and instruments.

Based on the information gathered, subsequent desk research has helped to identify the actor network around the Biographies by an intensive analysis of interactions (egocentric actor network analysis). This means that selected persons (from different departments) involved in the innovation process were interviewed. Building upon the intra-organisational interactions, the narrative interview was also the basis for an intensive analysis to identify the actors included in the innovation process outside the organisation. Additional semi-structured interviews were used in order to enrich and complete the findings from the narrative interviews (Strauss & Corbin 1990; Wengraf 2001; Yin 2014). In particular, interviews with actors outside the organisation were conducted to «follow up» on important interactions and to complete the respective Biography. Relevant interviewees in this sense can be users, as well as actors from the public, private, informal, and/or the non-profit sector. Triangulation has combined data from the individual, structural, and contextual level. The final step of writing and analysing the co-creation Biographies has been a process of telling a real, detailed, and «thick» story covering all relevant aspects. The triangulated data has been summarised in a coherent story. This includes an outline of the contextual settings, impulses through which the innovative idea arose in the first instance, how it further developed, the actor network, the actors' roles in the innovation process, modes of efficiency and governance, objectives, etc.

### 3.4. Analytical Grid: An Ecosystem of Co-Creation

Previous work in WP1 has shown that co-creation cannot be conceptualized in a straight linear logic. On the contrary, it must be captured in its multi-dynamic process-character and context-dependency. Given all the tensions between processes of governance on the macro-level, meso-or intermediate structures (characterized, for example, by organisations and alliances), and individual needs and role-conflicts on micro-level, research in the field must work on finding suitable concepts and methodologies. As a result of this previous work in SISCODE, the empirical framework comprehensively refers to the ecosystemic settings where co-creative practices and processes take place. In order to understand the individual journey, the potential, limits, and challenges co-creation cases face in their diverse settings, the survey is designed to take an ecosystemic perspective. Although the approach of an ecosystem of social innovation has not yet been thoroughly theorized, it is a term frequently used in public policy and social innovation research, building on different strands of innovation studies and the sociology of innovation (Domanski et al. 2019; Hansson et al. 2014; Pulford 2011). Taking up an ecosystem perspective, the analytical framework for the comparative analysis has been developed in SISCODE's Deliverable 1.3: Theoretical framework and tools for understanding co-creation in contexts (SISCODE D1.3). The ecosystem model serves as a heuristic for the purpose of an in-depth exploration of co-creation processes. The model has originally been introduced by Kaletka, Markmann, and Pelka (2017), differentiating four interrelated context levels of social innovation (SI) ecosystems. This ecosystem model, which was adapted from a model designed by Weischenberg (1990) for the analysis of media selection processes, was adopted in order to understand the complex environment in which social innovation initiatives are created, develop and flourish on the one hand and take effect or perish on the other hand. The model features four different contexts, which are also referred to as "layers" (Kaletka et al. 2017), as the ecosystem model is also described as an "onion" (ibid.). Each of these layers describes a distinct, yet interconnected context of drivers and barriers and factors supporting or impeding the development of initiatives and can be used as a framework for identifying driving and hindering factors in development processes:

1. Context of **roles**: Motivations and roles of all stakeholders, i.e. all actors that have a 'stake', hence also an interest, in the co-creation process;
2. Context of **functions**: management procedures, collaborations, business and governance models;

3. Context of **structures**: constraints and path dependencies of existing institutions, economic, political and technological imperatives;
4. Context of **norms**: professional and ethical standards, historical and legal conditions, codes, and other accepted social standards (cf. Eckhardt et al 2017: 85).

In its adaption and operationalisation for the comparative analysis of Case Studies, Biographies, and results from the Meta-Analysis in SISCODE, the ecosystem model was adapted and contexts were slightly re-framed to better grasp the research object of co-creation by analysing relevant norms, structures, actors and their roles, and functions. Figure 1 presents this adapted model, which is a major building block of the analytical grid for the analyses presented in the deliverable at hand. In the following chapters, this model will be referred to as 'ecosystem model' and sometimes also as 'onion model' or similar for more variety of formulations.

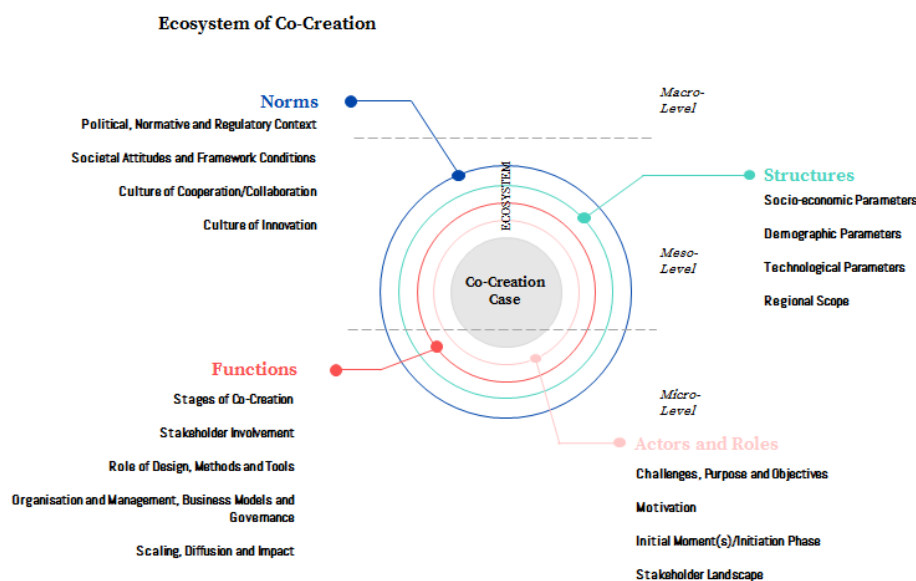


Figure 1 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

The inner layer of the **context of actors** (for more details on the operationalisation of actors, see below) **and their roles**, was operationalized with the 'challenges, purposes and objectives', such actors have who initiate co-creation processes. Directly linked to these motives and the linked motivations, 'initial moments' and a perspective on the 'initiation

phase' were added in order to collect more information on the very beginning of the co-creation processes. Furthermore, the 'stakeholder landscape' was added as an analytical unit to collect insights on the different actors involved in co-creation and addressed by co-creation.

The layer representing the **context of functions** was operationalized for SISCODE, first, by adding the element of the 'stages of co-creation', which refer to the general idea of a design cycle employed, for instance, for design thinking (Brown 2009). Similar to adaptations of the design thinking cycle like that of Vetterli et al. (2011), these stages were narrowed down to already guide the Meta-Analysis (SISCODE D2.1) and the comparative analysis to:

1. Problem identification / understanding
2. Ideation
3. Prototyping
4. Verifying / testing

However, this distinction between different phases was not intended to imply an understanding of co-creation as a linear process. Much more, they were defined to have separate units of analysis for the perspective on the co-creation processes. Second, the context of functions was added with the element of 'stakeholder involvement' in respect to invitation and selection procedures of participants. As co-creation processes are usually carried out with different tools and methods, these elements were also added - not at least as the SISCODE consortium has a great interest in the role of tools and methods just as in the role of design. Hence, also the element of design was added. In addition to the elements of organisation and management etc. already described by Eckhardt et al. (2017), the layer of the context of functions was also added with the analytical unit of 'scaling, diffusion and impact', which was already suggested in the original model by Kaletka et al. (2017). This factor enabled an analysis of the further uptake and continuation of co-creation under investigation.

The layer representing the **context of structures** was operationalized by adding the analytical units of 'socio-economic parameters', 'demographic parameters', and 'technological parameters', in order to make an analysis of the role of environmental factors possible. In this respect, also the "imperatives" (Kaletka et al. 2017) connected to these structures were put into focus – specified by these three different analytical units. Furthermore, the regional scope of the co-creation cases under investigation was added as

an element for this layer in order to shed light on the target area of co-creation cases and the links to the mentioned structures.

The fourth layer, **the context of norms**, was operationalized by adding a distinct unit of analysis for the institutionalized norms, namely the ‘political, normative and regulatory context’. Furthermore, norms already mentioned by Eckhardt et al. (2017) in the form of “social standards”, hence rather implicit norms or values, like “societal attitudes” (Kaletka et al. 2017) and cultural aspects, i.e. the ‘culture of cooperation’ and ‘collaboration’ and the ‘culture of innovation’, were added. All of these units of analysis were chosen as they were providing a basis for the analysis of societal framework conditions co-creation in its specific context is supported or hindered by.

All of the operationalisations described for the ecosystem model formed the basis for the qualitative content analysis described in the next section 3.5.

As already indicated in the previous paragraphs, actors, in general, have a crucial role for the analysis of co-creation. Such **actors** can generally be both, individuals (i.e. single persons) or collective actors (e.g. organisations, institutions, networks, groups, etc.). Furthermore, co-creation, by definition, demands the participation of **co-creators** (or simply “**participants**”), hence actors. From another perspective, such actors are also **stakeholders** of a problem addressed, which are also stakeholders of the co-creation activity at the same time. Findings in the course of analysis and suggestions made by SISCODE's internal reviewers of the deliverable at hand suggested a stronger differentiation of stakeholders. Hence, another distinction is guiding the analysis presented throughout the following chapters:

1. **External stakeholders** like **end-users** and the **participants** addressed to co-create and to become co-creators.
2. **Internal stakeholders**, hence such actors that are part of the project teams or project partners or the organisation or network planning and conducting the co-creation processes.

Furthermore, actors can also become both, **internal and external stakeholders at the same time** (see chapters 4.3., 5.3, and 6.3.). Additionally, not only external stakeholders are necessarily co-creators or participants. Of course, also project members or partners can be part of the co-creators, hence participants.



Another perspective on stakeholders (foremost external stakeholders) is part of the context of actors and roles of the ecosystem model. For the operationalisation of stakeholder constellations and the stakeholder landscape, we refer to the quadruple helix model of knowledge production (Carayannis & Campbell 2009), which is often referred to in social innovation research (e.g. Domanski et al. 2019; Hansson et al. 2014;). In this concept, innovation system actors from all societal sectors contribute to successful knowledge production, hence innovation. These actors are:

- “academia/universities,”
- “industry/business,”
- “state/government”
- and “media-based and culture-based public” (or: civil society) (ibid.)

It is the overall aim of the empirical phase to generate results in the form of a comparative understanding of the interactions between these different social dimensions on macro-, meso- and micro-level and specifically to find out as much as possible about the modalities of how stakeholders and their everyday practices interact with environmental factors.

Furthermore, the analysis presented in subsequent chapters made a distinction between **tools** and **methods** necessary. Although there was no clear assignment found the material, tools, and methods can generally be differentiated based on the level they are addressing. Hence, for analytical reasons, we decided to understand methods as larger approaches utilized to provide a playground and a frame for co-creation activities. Such methods are, for instance, workshops but they can also be used in a framework of a larger method, like worldcafés in the framework of a workshop. Basically, methods are not tangible. Tools, on the other hand, can be both, tangible (e.g. a screwdriver or a smartphone) and intangible (e.g. a video or a persona). Different to methods, they are not providing a framework for co-creation. Much more, they enable co-creation just a screwdriver enables the assembly of a tangible object.

A last distinction for analytical reasons and for better understanding co-creation in practice was made for processes of co-creation and their framework. Whereas the **co-creation process** is the process where co-creation (or: collaboration between co-creators/participants) is taking place, **co-creation initiatives** (synonymous: **co-creation activities / projects**) provide the framework for co-creation. Hence, they are usually collective actors like organisations, networks, or groups.

### **3.5. Qualitative Content Analysis of Co-Creation Case Studies and Co-Creation Innovation Biographies**

The comparative analysis presented in this report is mainly based on a qualitative content analysis of the data provided by the Co-Creation Case Studies and the Innovation Biographies (see D2.2. Case Studies and Innovation Biographies Report). Altogether, the text basis for the comparative analysis covers 55 cases. This amount of data needed careful handling. Both text types (Case Studies and Biographies) have been written on the basis of two comparable templates of questions (see explanation of research design for Co-Creation Case Studies and Co-Creation Biographies in D2.2). The templates are based on the analytical grid for 'ecosystems of co-creation'. Therefore, both text types yield comparable contents. For this reason, coding for Cases and Biographies has been aligned, meaning that the same code system has been applied to Case Studies and to Biographies using the software MaxQDA as a qualitative data analysis tool. For several reasons, sometimes Case Studies gave more detail on certain aspects and in other cases, the Biographies allowed for a more in-depth analysis. In effect, this means that the comparative analysis of Co-Creation Case Studies (chapter 4) and the comparative analysis of Co-Creation Innovation Biographies (chapter 5) partially include similar explications of the cases, because they are derived from the same co-creation projects, initiatives, and processes. However, the difference is of course that the Innovation Biographies aimed at a more detailed description and analysis of one single co-creation process within the projects and initiatives presented as Co-Creation Case Studies. Even though all authors tried their best to develop the cases according to the templates for Case Studies and Innovation Biographies, certain redundancies between the content given in Co-Creation Cases and Co-Creation Innovation Biographies could not be avoided. Hence, these redundancies have to be reflected in the comparative analysis as well.

Both tasks, writing the Case Studies and Biographies, have been a challenging undertaking for all partners involved due to the complexity of processes that relevant to the SISCODE analysis. Furthermore, besides the complexity of each case, the number of cases to handle was also a challenge. Altogether, 55 qualitative co-creation cases have been researched, written, coded, and analysed. In sum, 9 partner organisations have contributed cases based on the same template but each with a unique approach to their Case Study. Furthermore, different backgrounds of partners made different interpretations possible. This sometimes resulted in some difficulties regarding the way in which comparisons are possible. Furthermore, all cases which are the data basis for this deliverable are published in

SISCODE D2.2 Case Studies and Innovation Biographies (SISCODE D2.2) report. Because the deliverable is publicly available, authors were asked to cross-check their cases with interviewees in order to be able to eliminate any misunderstandings and to gain approval for publication. As follows, cases have not been analysed anonymously. This might contribute to the fact that we might miss some further critical elements, for example regarding the aspects of conflict and cooperation as well as an in-depth exploration of failures and doubts.

But nevertheless, after comparing all cases we can highlight certain elements that become evident for most cases and can single out important enablers and barriers on all four levels of the ecosystem model. This has been possible, since partners who contributed to developing the case study research matured a deep knowledge about the concerned Case Study, e.g. due to previous research. Furthermore, partners had in most cases good access to stakeholders and interview partners. Last but not least, most cases were conducted by native speakers in the respective context which also allowed improved access and understanding of each case. All partners stated that writing up the Co-Creation Case Studies and Co-Creation Innovation Biographies has been an important learning experience because each case represents in itself a detailed analysis of a specific co-creation project/initiative. It has widened and shaped the perspectives of authors on the complexity of the processes involved.

## 4. Comparative Analysis of Co-Creation Case Studies

Content and quality of the Co-Creation Case Studies presented in D2.2 differ to a certain extent. Sometimes, authors did not explicate aspects of a co-creation case for all layers of the ecosystem model (norms, structures, functions, actors, see chapter 3.4). Therefore, the comparative analysis leaves some minor blind spots for some of the categories that have been examined. Overall, the comparative analysis of the Co-Creation Case Studies gives a valuable insight into the contextual factors that shape co-creation. The following table 2 provides an overview of the selected Case Studies:

Table 2 Short description of the selected Case Studies

Case Study	Short description
<b>Apulian ICT Living Lab</b> <i>Apulia Region / Italy</i>	Apulian ICT Living Lab is an initiative promoted by the Regional Government of the Apulia Region in Italy, and in particular by the Economic Development, Employment and Innovation Department – Industrial Research and Innovation Service, and implemented by InnovaPuglia, an in-house company of the Apulia Region - Technical Support Division, supporting the regional strategic planning in terms of digital innovation.
<b>Borgernes Hus (The Citizen House)</b> <i>Odense / Denmark</i>	An innovative collaboration between the city of Odense and two design agencies has created a solid concept for the development of the city's most pivotal house, creating a shared urban space for citizens and businesses alike.
<b>Boxing Future Health</b> <i>Copenhagen / Denmark</i>	Boxing Future Health consists of four physical scenarios that take the form of four cylinders which can be entered to feel, smell, and listen to alternative futures for healthcare anno 2050.
<b>Centre for Social Innovation (CSI) Toronto</b> <i>Toronto / Canada</i>	Members of the Centre for Social Innovation work across sectors to create a better world. The Centre for Social Innovation accelerates their success and amplifies their impact through the power of co-working, community and collaboration.
<b>LTsER Montado</b> <i>Portugal</i>	The project combines the practice, productive, ecological as well as cultural aspects of socio-ecological systems to promote improved management of cork trees forests and help facilitate the wellbeing of montado in the long term.
<b>Ecomuseo Casilino ad Duas Lauros</b> <i>Rome / Italy</i>	It is a project based in the eastern suburbs of Rome. Through the knowledge and recognition of the local cultural heritage, the project aims to involve the communities to build a new governance of the territory, based on innovative models of sustainable development and urban regeneration.
<b>E-FABRIK'</b> <i>Paris / France</i>	This project brings together differently-abled people and young adults in NEET (neither in employment, education or training) to design and build prototypes which respond to the everyday need of the differently-abled people, using digital fabrication tools in a collaborative design process.

<b>Engineering Comes Home</b> <i>London / UK</i>	The Engineering Comes Home project applied the principles of co-design to the problem of reducing water, energy and food resource impacts in a social housing community in London.
<b>Extreme Citizen Science's Intelligent Maps Project</b> <i>Congo, Namibia, Brazil</i>	The project designs, develops, evaluates and deploys methodologies and tools that enable people with no or limited literacy to use smartphones and tablets to collect, share, and analyse (spatial) data.
<b>Fab City Grand Paris (FCGP)</b> <i>Paris / France</i>	Fab City Grand Paris is a local network of makers, designers, architects, urban farmers and innovators engaged in the rise of the circular and collaborative economy in the Parisian urban area.
<b>Fine Feathers Make Fine Birds</b> <i>Netherlands</i>	It is a design challenge organised by Cube design museum in Kerkrade (NL), initiated by a Dutch medical doctor, in which a multidisciplinary student team used design thinking methods to find solutions in co-creation with museum visitors and different stakeholders. The aim of this project is to develop a clothing concept that allows people own clothing to be adapted so that it becomes suitable when they become dependent on care or nursing and thus allowing them to keep their own identity.
<b>Smart Kalasatama Well-being Centre</b> <i>Helsinki / Finland</i>	The aim of the piloting program was to co-develop and experiment new solutions that improve the resident's well-being. The Kalasatama Health and Wellbeing Center, corporate partner Kesko's occupational health and the residential district served as a Living Lab.
<b>The BrainHack Project</b> <i>Amsterdam / Netherlands</i> <i>Prague / Czech Republic</i> <i>Dublin / Ireland</i>	The BrainHack Project aims to connect scientists, artists and the general public who are interested in human-brain-generated signals. The BrainHack Project's main goal is to inspire both scientific and artistic communities to use the BNCI interfaces, to engage with all the different facets of brain research.
<b>Ilona - Robot Brings Joy in Elderly Care</b> <i>Lahti / Finland</i>	Within Lahti Living Lab, a Case Study was conducted to identify the impacts and acceptance of care robot implementation among users in elderly care services - care personnel and elderly customers - with the help of the Human Impact Assessment approach.
<b>inDemand</b> <i>Murcia Region / Spain</i> <i>Paris Region / France</i> <i>Oulu Region / Finland</i>	inDemand is a new model where Healthcare organisations and companies co-create Digital Health solutions, with the economic support of public regional funds in three pilot regions: Murcia Region (Spain), Paris Region (France) and Oulu Region (Finland).
<b>Innovation Strategy for the Capital Region of Denmark</b> <i>Capital Region of Denmark / Denmark</i>	In 2017, DDC conducted a strategy process for the Capital Region of Denmark framed by design thinking and design management methods and driven by the regional administration's desire to support innovation environments that secure consistently high levels of quality when new knowledge is implemented.
<b>Lab of Collaborative Youth (LoCY)</b> <i>Porto / Portugal</i>	It is a Porto-based initiative/project that aspires to support Youngsters in their self-empowerment as learners, citizens and co-creators, meanwhile giving an opportunity to other stakeholders to reflect on this processes and possible changes in their methodologies on how to follow Youth transformation.

<b>Library Living Lab</b> <i>Barcelona / Spain</i>	<p>The Library Living Lab (L3) is an open, participatory experimental space, fully integrated with a public library in Barcelona Area. The aim of the project is to create a physical space, build the ecosystem around it and implement the necessary methodologies that allow all stakeholders to jointly explore how technology transforms the cultural experience of people.</p>
<b>Making Sense H2020 Project</b> <i>Amsterdam / Netherlands</i> <i>Barcelona / Spain</i> <i>Prishtina / Kosovo</i>	<p>It is an H2020 EU project ICT2015 and aims to explore how open-source software, open-source hardware, digital maker practices, and open design can be effectively used by local communities to fabricate their own sensing tools, make sense of their environments and address pressing environmental problems in air, water, soil, and sound pollution.</p>
<b>MARINA - Marine Knowledge Sharing Platform for Federating Responsible Research and Innovation Communities</b> <i>World-wide</i>	<p>MARINA is an open collaborative platform that involves societal actors in marine research and innovation. They share information and best practice, co-create solutions to marine societal challenges, generate action plans and put forth policy recommendations based on Responsible Research and Innovation.</p>
<b>Medialab Prado</b> <i>Madrid / Spain</i>	<p>Medialab Prado is a programme run by the Madrid City Council's Culture and Sports Department since 2000. It is a place of experimentation in which different local stakeholders can learn to cooperate one with another. There are six labs, each oriented towards a specific aim or approach.</p>
<b>Mirrorable</b> <i>Milan / Italy</i>	<p>Mirrorable is a domestic interactive rehabilitation platform developed in 2016 by the founders of FightTheStroke© with the CNR Neuroscience of the Università di Parma. It represents a unique model of home rehabilitation therapy based on the activation of mirror neurons, through gamification and peer-learning processes.</p>
<b>Museomix</b> <i>International</i>	<p>Museomix is a three-day hackathon that takes place once a year in different museums around Europe. Museums propose challenges to multidisciplinary teams that respond to these challenges by designing functional mediation devices as prototypes.</p>
<b>NESTA - Everyone Makes Innovation Policy - 10:10's Heat Seekers' Quest</b> <i>London / UK</i>	<p>The case aims to explore the ways to recycle wasted heat through a 'heat seeking quest' where the public was invited to walk through the streets of London with thermal cameras measuring areas of heat loss.</p>
<b>ninux.org</b> <i>Italy</i>	<p>The case concerns an emerging typology of grassroots information infrastructure for digital communication, defined as a wireless community network (WCN). WCNs are bottom-up infrastructures built and self-managed by "communities" of voluntary people like hackers, geeks and lay people.</p>
<b>Ocean Living Lab - Smartifier Case</b> <i>Finland</i>	<p>It is a Finish product developed and tested in the framework of a regional funded project which was looking for an international partner to develop their service design further, gather feedback from local users in other countries (Spain and France in this case) and internationalize their service.</p>

<b>PIKSL - Person-Centred Interaction and Communication for More Self-Determination in Life</b> <i>Germany</i>	The case aims to facilitate (digital) participation in society and enable a self-determined life by providing PIKSL labs with an open space for inclusive exchange, learning, and co-development. The labs are accessible for everyone, but the focus is mainly on people with learning difficulties. These people are actively involved in co-creation processes.
<b>REMODEL</b> <i>Denmark</i>	REMODEL is an initiative to explore how manufacturing businesses can use open source methodology and principles to develop environmentally sustainable and economically sound business models in the manufacturing of physical products.
<b>RETRACE – Interreg Europe Project</b> <i>EU</i>	RETRACE (REgions Transitioning towards Circular Economy) aims at promoting systemic design as a method allowing local and regional policies to move towards a circular economy when waste from one productive process becomes an input in another, preventing waste being released into the environment.
<b>Science Frugale</b> <i>Paris / France</i>	Science Frugale is a forum-exhibition exploring how to do low cost experimental scientific research by hacking various available technologies, at the crossroads between experimental scientific research, maker culture, and cooperation with developing countries.
<b>Sciencewise – Involve and UK Government BEIS</b> <i>UK</i>	Sciencewise provides evidence of public views on emerging areas of science and technology by supporting government departments to design, commission and run deliberative public dialogues. This improves the effectiveness of policymaking by strengthening the evidence on public perspectives and values.
<b>Será que o mar vai engolir o Bairro?</b> <i>Lissabon / Portugal</i>	This project promotes the meeting of lay people and researchers for the co-creation of locally relevant open research questions -- related to the evolution of the sea near a precarious neighbourhood -- and the participatory documentation, study, and communication of the problem.
<b>Sharing City Umeå</b> <i>Umeå / Sweden</i>	Sharing City Umeå is a test-bed for sharing economy activities in the city coordinated by Umeå municipality. The purpose of the program is to share resources in a city more effectively, sharing knowledge between the participating cities. Sharing Cities are also based on the principles of open source and open data.
<b>Sliperiet / Den Koldioxidsnåla Platsen (The Low Carbon Place)</b> <i>Umeå / Sweden</i>	Sliperiet is a cross-disciplinary, collaborative and experimental platform at the Umeå Arts Campus. It is a place where researchers, businesses, students, entrepreneurs, and creatives meet to develop and realise ideas.
<b>SMART_KOM. Kraków in Smart Cities Network</b> <i>Kraków / Poland</i>	The aim of the project was to build a smart strategy for sustainable and smart city development, including effective management, addressing the needs of citizens, using modern technologies and tools in order to improve the quality of living across the entire Municipality of Krakow and surrounding area.
<b>Social Innovation Lab Kent (SILK)</b> <i>Kent County / UK</i>	The Social Innovation Lab Kent (SILK) is a small team based within Kent County Council set up in 2007 to 'do policy differently'. The early projects led to the development of a human-centred methodology and toolkit which draws on tools from social science, community development, business, and design.

<b>SPARKS – Rethinking innovation together</b> <i>EU</i>	Rethinking innovation together was a major awareness-raising and engagement project to promote RRI through the topic of technology shifts in health and medicine. It took shape via a traveling exhibition and a set of participatory activities taking place in 29 countries.
<b>The Australian Centre for Social Innovation (TACSI)</b> <i>Adelaide / Australia</i>	Formed in 2009 as an initiative of the South Australian Government, TACSI is now an independent social enterprise working on projects and initiatives across Australia. The purpose is to create better lives by shifting systems, demonstrating what is possible, and developing replicable approaches to social innovation.
<b>Innovation Loop Region Västerbotten</b> <i>Region Västerbotten / Sweden</i>	The innovation loop is a process formed and currently implemented in the county Västerbotten, in the northern parts of Sweden. The main purpose is to create the best possible atmosphere and excellent opportunities for ideas and innovation to flourish.
<b>Urban Mediaspace Aarhus Project – Dokk1</b> <i>Aarhus / Denmark</i>	The case aims at exploring the participatory method adopted to develop the project of a new public building and services in Denmark, involving citizens, employees, the services' main users and local stakeholders over the years, applying a new form of governance in public services and spaces.

#### 4.1. Comparing the role of normative, political and regulative contexts

In this chapter, the analysis of the Case Studies focusses on the macro-level of norms of the ecosystem model used for SISCODE (see figure 2). In this respect, normative, political, and regulative frameworks are looked at. This chapter starts with an illustration of political issues and trends, which are treated by the initiatives examined in the Case Studies. Further on, light will be shed on different cultures of collaboration and cultures of innovation. Finally, some lesson learned, drivers and barriers are presented, which the authors of the Case Studies have pointed out.



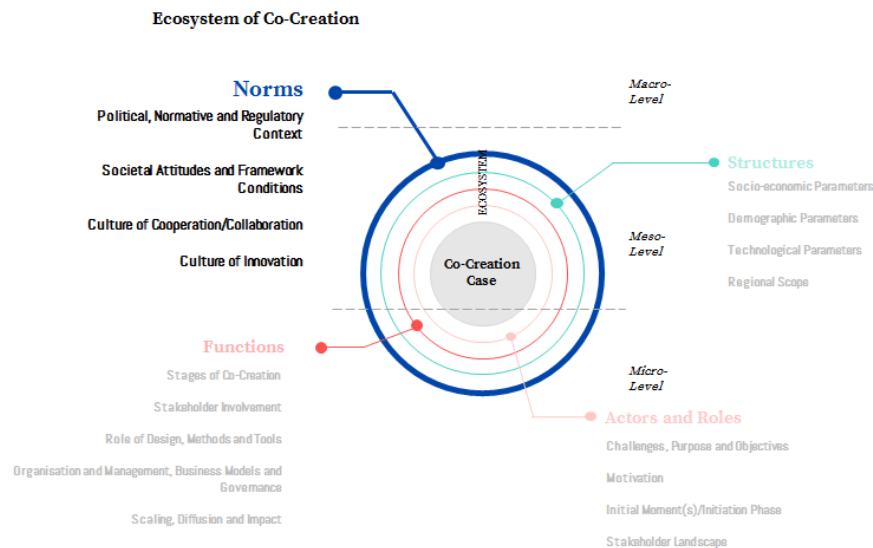


Figure 2 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

The importance of leading political norms seems to be a major issue as 60% of the initiatives under examination seem to correspond very closely to them. This is probably based on the fact that they get explicit support and in most of the cases also (co-) funding by the national government or administration bodies or the European Commission. Thus, a number of initiatives deals with issues that belong to societal and political trends one can observe in recent times, such as:

- Sharing economy
- Efforts to increase the number of inhabitants again in areas affected by migration
- Inclusion of persons with disabilities
- Environmental protection/climate change
- Citizenship and participation of youngsters
- Demographic change/health care
- Digitalization

Some initiatives are linked very strongly to the legal context of the country in which they are developed. For example, the *Ecomuseo* initiative (in Italy) sees itself as a reaction to the subsidiary principle pointed out in the Italian constitution. Furthermore, some initiatives are constituted as a legal form according to the law of the respective country. Similar to that, *Mirrorable* was constituted as a Limited Company (Ltd.) in order to be able to apply in

European calls and to have access to funding provided for innovative start-ups. Other initiatives are embedded in regional or national political agendas (e.g. *Sharing City Umeå*, *Urban Mediaspace Aarhus Project – Dokk1*, *Innovation Strategy for the Capital Region of Denmark*, *Lab of Collaborative Youth (LoCY)*, *Apulian ICT Living Lab*). Thus, they are institutionally connected to the political agenda-setting of their respective context. However, there are also initiatives like the *Centre for Social Innovation (CSI) Toronto* or *Mirrorable* which were started to address issues, which were not considered by public institutions or as a cut of public investments in solving several societal challenges occurred.

A main feature of an ecosystem that is fruitful for co-creation processes found in the Case Studies is a culture of collaboration between the actors. Most evidence for a culture of collaboration was observed in the areas of government and administration. A main indicator for an advanced culture of cooperation and collaboration are politicians officially pointing out that collaboration is needed to solve complex problems. In some cases, government or administration bodies are active partners of the initiatives. A main reason for government bodies to pursue collaborative approaches is the need to include the citizens' views in political decisions. In the *Borghernes Hus (The Citizen House)* initiative, public administration and citizens co-create new forms of action in the region. In the case of *Sciencewise – Involve and UK Government BEIS*, citizens are involved in collaborative action to re-gain their trust in politics and academia. Many cases show that an advanced culture of cooperation and collaboration can be the result of experiences from earlier collaborative projects. In some cases, a culture of cooperation and collaboration is institutionalized and written down in laws like the regional “Law on Participation” in the case of *Apulian ICT Living Lab* or contracts like the “Open Government Partnership” in Madrid, which was a starting point for the *Medialab Prado* initiative. It seems that a culture of cooperation and collaboration could be fostered if organisations specialized in design, like the “*Danish Design Center (DDC)*” are active parts of the ecosystem. The Case Study *Sliperiet / Den Koldioxid snåla Platsen (The Low Carbon Place)* illustrates that a non-hierarchical and collaborative culture in a university can support co-creation processes and contributes to the development of a co-creation culture in the ecosystem.

A main characteristic of co-creation is the goal to create new products, services, or social practices – in other terms: innovations. Thus, a second important component of a co-creation friendly ecosystem is an advanced culture of (social) innovation. For some initiatives, innovative environments can be identified. In some cases, after a long period where socially innovative approaches were only carried out by the non-profit sector, today

social innovation is incorporated in university programmes; local initiatives and laws (*Centre for Social Innovation (CSI) Toronto*). The number of initiatives that classify as social entrepreneurship increases as well. It seems that metropolises and large urban contexts with a young and well-educated population tend to be an innovative environment. They gain benefits from the innovative environment that is caused by the high number of people living there, their diversity, and their ideas (e.g. *E-FABRIK*). Often, such cities or regions already heard out some more innovative projects than the initiatives under examination. Furthermore, in many metropolises, an impulsive FabLab and start-up culture emerged that contributes to an innovative environment as well.

On another note, business initiatives benefit from an entrepreneurship-friendly environment, which is illustrated by several business awards found in the Case Studies. The same applies to the social innovativeness of cities or regions. Several cases are situated in regions where public administration actively tries to be socially innovative and to be recognized as socially innovative, for instance by receiving awards for local innovativeness (*Sharing City Umeå*).

However, receiving an award for social innovativeness does not appear to be the main reason for starting the initiatives described in the Case Studies. Much more, it seems that many cities and regions recognized the necessity to foster social innovations in order to solve complex problems and to include the citizen's view in political processes. While in most of the cases social innovation should be created in projects or initiatives, one approach goes beyond time-limited actions and aims to institutionalize social innovativeness: In Kent, the *Social Innovation Lab Kent (SILK)* became a unit in the regional government body. This underlines the importance the government dedicates to social innovativeness even if the protagonists of the lab criticize that it tends to turn from an innovation lab to a service unit. In the following, some lessons learned, drivers, and barriers within the normative, regulative, and political context are presented.

Numerous Case Study authors pointed out that progressive government and administration bodies that promote participation and collaboration are important drivers for the initiatives. However, the structures and cultures of administrations often lack on mechanisms to incorporate the view of citizens. Some of the actors recognized this and started initiatives like the ones described in the Case Studies (e.g. *Social Innovation Lab Kent (SILK)*, *Sciencewise – Involve* and *UK Government BEIS, Innovation Strategy for the Capital Region of Denmark*). To find solutions for the challenges, actors, and even

governments and administrations need to achieve a holistic view that combines different issues, for instance, technical and societal ones. The experiential knowledge government and administration bodies gain by participating in co-creation initiatives can lead to a cultural change in these organizations. Therefore, the willingness of the participating organizations to change their performance contributes strongly to the success of the initiatives. However, not only the willingness of government and administration is crucial for the success of new approaches like co-creation. The author of the *Ilona - Robot Brings Joy in Elderly Care* Case Study, which takes place in Finland, emphasizes the driving power of a progressive climate in a society, which is characterized by values like openness, transparency, and trust.

Besides the positive aspects, there are still barriers concerning political, regulative, and normative contexts. Most of them are located on the normative level. Thus, working routines and established beliefs about how governments and administration should work appear to be major barriers. In this respect, bureaucracy and the resistance of civil servants against new approaches of participation and collaboration were identified as strong barriers in several Case Studies. For example, *Social Innovation Lab Kent (SILK)* as a social innovation unit in a governance body felt decoupled from the other units and noticed that their qualitative approach was not accepted by the other units, which prefer “hard facts” and numbers. In general, it seems like an innovation culture fixed on technical solutions is hindering a focus on social innovations concerning the change of behaviour in certain parts of society. Another barrier observed was that politicians and experts feared the exchange with the public because of their fear of revealing weaknesses regarding some issues.

Due to cross-sectoral collaboration being crucial for co-creation, silo thinking, mainly observed in public administration bodies, appears as a barrier. It still seems to be a serious challenge to broaden the field of view of public administration actors beyond their well-known standard procedures. The culture of collaboration and innovation is endangered if public institutions offer participatory approaches to the citizens without creating tangible results in the end. If they get the impression that Potemkin’s “Potemkinian villages” are constructed by the administration, people will lose trust in collaborative projects: The author of the *Social Innovation Lab Kent (SILK)* Case Study mentioned the ‘consultation overdrive’ since the late 1990ies in the Kent region. There were many participatory projects but the impact was low. In the Case Study of the *Lab of Collaborative Youth (LoCY)*, the author observed that pupils lost the desire to engage in co-creation when they noticed that the first results they produced were not recognized by the school community. Another

action-leading logic that could hinder the success of innovative initiatives as well is the combination of co-creation with an open-source approach. Offering solutions free of charge is an approach not complementary with the predominating current logic of funding organizations and companies that creating solutions should always result in profit. In the case of the *Centre for Social Innovation (CSI) Toronto*, outdated laws are also marking a legal barrier for non-profit co-creation approaches because these laws clearly prioritize profit to innovation. Nearly all initiatives under examination are executed or supported by third sector organizations. If third sector organizations are under political and financial pressure, they are not able to foster the diffusion of an innovation after funding ran out. Thus, the funding regulations launching initiatives very limited in time can actually hinder the sustainable scaling and diffusion of innovative solutions.

However, existing norms do not only cause barriers on the level of government and administration. Norms are internalized by citizens (end-users) as well and could be the reason for mistrust against new approaches. The *Mirrorable* Case Study shows that a new approach different from the institutionalized norms was not completely accepted by the end-users. Users did not accept the solution developed by co-creation as they did have to pay for it. The *Mirrorable* initiative developed therapy approaches for children with disabilities, which could not be offered for free. Due to the fact that the Italian Health system usually offers free treatments, end-users were not ready to accept a new offer they had to pay for.

As most co-creation initiatives in the Case Studies depend on funding and the main funding source are governmental bodies, it is no surprise that this chapter on the normative and regulatory context focuses on explicit regulative norms set out by the governments on one hand, and (hidden) norms that influence and drive the governments' behaviour on the other. Accordingly, the success of co-creation mainly depends on the openness of government and administration bodies for approaches that address societal rather than technological issues. One has to overcome the paradigm that knowledge has to be developed in closed systems and this has to be shared and partly delegated from the experts to the users. Reflecting the political, regulatory, and normative conditions, structuring an ecosystem should be part of projects and initiatives, which aim to implement social innovations, including the change of behaviour of the main actors in the ecosystem. Exploring these conditions should be an important part of a project's risk management.

## 4.2. Comparing the role of socio-demographic and economic contexts

In this chapter, we give a short overview of the socio-demographic and the socio-economic contexts of the Case Studies. To do so, some information about the scope of the co-creation cases as well as the socio-demographic and especially the socio-economic contexts are provided (see figure 3).

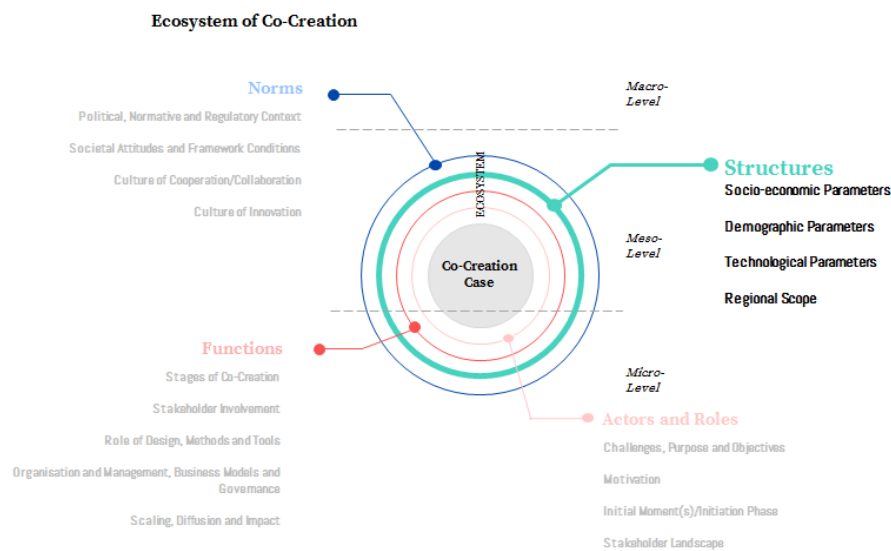


Figure 3 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

The Case Studies represent a wide range of geographical conditions from European metropolises to the African rain forest. Most of them (more than 75%) act on local-, city-, or regional level, whereas others are included in European networks (e.g. projects funded by the European Commission). But co-creation cases that are included in European networks are situated on a smaller geographical level -most of them take place in urban or rural contexts within Europe. Furthermore, numerous co-creation cases cover more than one place of action, e.g. if it is an EU project and it has to distinguish between the places of action a project covers and the explicit single places of action that we call the primary ecosystem in which co-creation is applied. Of course, the European level and the project as a whole are constituting an ecosystem as well. But how it initially develops is mainly dependant on the primary ecosystem. In a few Case Studies the initiative is linked to geographical conditions as for example the project *Será que o mar vai engolir o Bairro?*,

that aims at investigating the risk of a river flooding a slum, or the initiative *LTser Montado*, that promotes environmental protection concerning a special type of oaks, illustrates.

The Case Studies take place in a variety of socio-economic settings ranging from booming metropolises to disadvantaged areas or areas of poverty like slums. Some of them face specific socio-economic challenges like an aging society or the restructuring of economic structures. For example, *The Australian Centre for Social Innovation* works on reducing the crime rate of aborigines by co-creating common views of aborigines and the Australian justice system. *Ilona - Robot Brings Joy in Elderly Care*, as another example, aims to find technical solutions in the care sector (the use of robots) to meet the challenges of an aging society. The *Innovation Strategy for the Capital Region of Denmark* is looking for solutions of increasing costs in the health system caused by demographic change. Contrary to these examples, the project *Será que o mar vai engolir o Bairro?* aims to investigate the risk that a river floods a slum does not address the socio-economic challenges. But the project had to handle the fact that most of the inhabitants of the slum, they wanted to animate for the co-creation process, are excluded from the school system and the labour market. Therefore, it was difficult to get them to make serious contributions to the project. Also, most Case Studies took place in the booming metropolises, other issues than socio-economic challenges were pointed out. They aim to develop “smart cities” or work on general structures and processes of co-creation to foster the collaboration of the variety of actors who are included in the quadruple helix (see chapter 3.4). Having these two kinds of examples in mind, it can be said that it is important to underline that the socio-economic parameters characterizing an ecosystem could be both - the conditions under which the initiative has to create solutions and needs to be considered as well as the challenge itself.

One important passage of the Case Studies was the section on “lessons learned” where the authors drew their own conclusions. Moreover, they named drivers and barriers concerning the socio-demographic and socio-economic parameters of the respective ecosystems. Thereby, the exploration of more than just one ecosystem was outlined. Especially when initiatives aimed to co-create solutions that work universally. *The Ocean Living Lab*, for example, tested products by using co-creation in several markets supporting the internationalization of the product. If a project takes place in more than one ecosystem, it is important to recognize the specific conditions in each of those ecosystems to acquire legitimization from stakeholders. Regarding the economic constitution of an ecosystem, it can be stated that the predominantly linear market model could be a barrier for the by nature non-linear co-creation process.

All in all, most of the Case Studies focus on the co-creation processes themselves, the stakeholder constellations as well as on the cultural, normative, and regulative contexts surrounding the initiatives. But as this short chapter shows, the socio-demographic and especially the socio-economic parameters should be kept in mind before designing a co-creation process. Especially when they are not directly linked to the addressed challenge of the initiative. But it has to be in mind, that the surrounding conditions have to be taken into consideration to represent potential barriers.

### 4.3. Comparing Co-Creation on micro -level - the role of stakeholders, methods and cooperation

In this chapter, the inner layer of functions of the ecosystem model explained in chapter 3.4 (see figure 4) is looked at in regard to the co-creation cases. Hence, it foremost comprises the concrete approaches and practices chosen and realized on the level of the co-creation activities themselves together with different actors, both internal stakeholders (e.g. project teams, project partners) and external stakeholders (e.g. participants, end-users). In this sense, this chapter addresses the design of co-creation processes and the concrete practices linked across the cases as well as their further development and the management of the single cases.

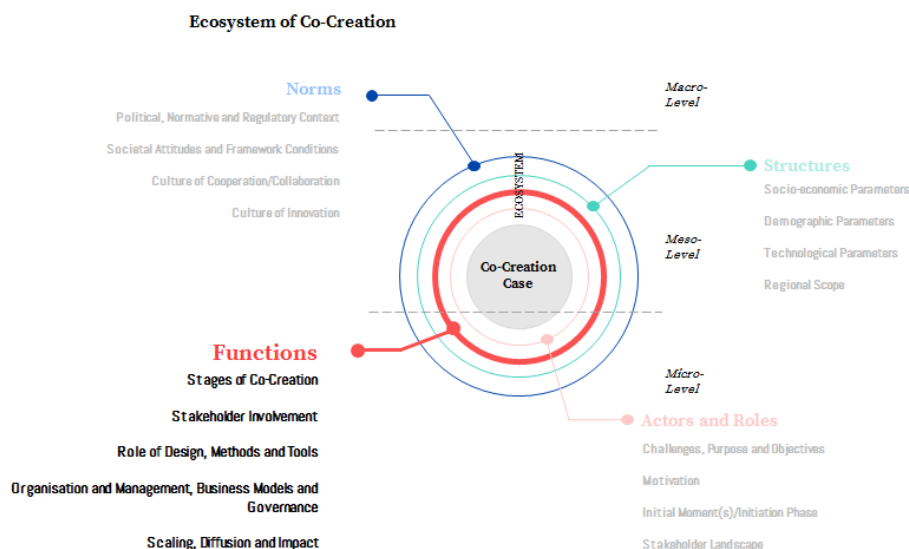


Figure 4 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)



#### 4.3.1. The Co-Creation Process

##### *Function, selection and invitation of stakeholders*

As already described in chapter 3.4, co-creation, by definition, demands the participation of **co-creators** (or simply “participants”), hence **stakeholders of a problem addressed**, which are also stakeholders of the co-creation activity at the same time. In this chapter, the focus is generally on all different stakeholders. This perspective includes both, **external stakeholders** like end-users and the participants addressed to co-create and to become co-creators and **internal stakeholders**, hence such actors that are part of the project teams or project partners or the organisation or network planning and conducting the co-creation processes. As this chapter will show, actors can also become both, internal and external stakeholders at the same time - especially in cases where co-creation is a guiding principle across all levels and where formerly external stakeholders are invited to become internal stakeholders or where projects were evolving bottom-up, hence external stakeholders were the initiators. Furthermore, not only external stakeholders are necessarily co-creators or participants. Of course, also project members or partners can be part of the co-creators although there was no major focus in the Case Studies on their role beyond their participation as moderators or facilitators.

However, while there are several cases where a large variety of participants from different contexts was in the co-creation processes, there were other cases where there was a lack of participants from specific domains like policymakers or citizens. In cases with such a lack of involvement, it was not only the external stakeholders' individual decision not to participate that was relevant. Much more, the projects sometimes only addressed specific participant target groups and did not invite other groups of external stakeholders. As shown in the following sections, participants were selected and invited for different reasons and in different ways: They were invited to fill out specific roles (e.g. knowledge providers, end-users) and they were invited to support their empowerment. Furthermore, their invitation was realized by a variety of means, including rather individualized approaches like direct appeal and rather open approaches like open calls.

##### *Selection and function of participants*

Throughout all cases, there has been the involvement of all different external stakeholder groups as participants in co-creation. A broad spectrum of participants is identified, like citizens, civil society organisations and individual citizens, policymakers and representatives of public administration, scientists (also interdisciplinary teams),

professionals, experts, entrepreneurs, and others. While it remains unclear whether is due to the selection of cases or a pattern significantly observable in practice, most of the initiatives are aiming at the engagement of citizens or civil society in broader terms (i.e. also collective actors) with a main emphasis on their role as end-users. Some initiatives aim to include the public in more general terms (e.g. in a specific geographical area, e.g. regional at *Social Innovation Lab Kent (SILK)*, local at *Medialab Prado*, or even on a national level at *ninux.org*). Other initiatives focus on more specific groups in civil society, which are affected by a concrete problem and its solution by co-creation. These are, for example, local residents and care recipients or civil caregivers (e.g. parents; see *Mirrorable*), persons with learning difficulties, and many others. However, there are also cases where experts represent the perspectives of the target group of the solution rather than laypersons – for instance when partners found laypersons not to have the necessary skills for contributing in co-creating solutions to a complex problem (e.g. a strategy in the *Koori Justice Unit*, see *The Australian Centre for Social Innovation (TACSI)*).

From the perspective of a quadruple helix of knowledge production, innovation system actors from all societal sectors (i.e.: “academia/universities,” “industry/business,” “state/government” and “media-based and culture-based public”; (Carayannis & Campbell 2009) and beyond (e.g. schools, civil society in general) are actively taking part across the cases. In some cases, helix-actors are explicitly addressed as such (e.g. *Library Living Lab*), hence revealing a focus on knowledge production or innovation with the explicit aim of participant diversity.

However, in most of the cases, different external stakeholders are invited to participate for their specific expertise or – more generally – based on their specific function rather than for the sake of including actors from all four helix strands in a respective co-creation process. From the different projects’ perspectives, participants have different functions: sometimes, they are only included in selective phases of co-creation, e.g. when they are only asked to participate in earlier stages or only in later stages when testing prototypes. In other cases, they are participating in the entire process right from the beginning up to the development- and testing stages. This differing integration of external stakeholders as participants across the stages can be related to the overall pathway of a co-creation project: on the one hand, when it is evolving bottom-up, the target group of the solution is probably already part of it right from the beginning. Hence, they are already part of the initial stage of problem identification. On the other hand, when an activity is implemented top-down,

the target group of the solution is included to participate as external stakeholders and is, therefore, not necessarily part of the initial stages.

In general, external stakeholders are asked to participate in the co-creation projects for different activities and goals: sometimes they are included to co-create (be it in all or selective stages), sometimes they are needed to evaluate the suitability of a solution. In other cases, participants are invited to identify a challenge and in later phases, professionals are realizing the solution without their participation. Furthermore, there are cases where participants are invited to evaluate final or intermediary solutions. Generally, participants in co-creation serve different functions for the projects and sometimes these functions are the main reason for their involvement rather than the goal of realising participation. For instance, they are knowledge-providers or they provide access to other participants wanted or needed for co-creation and of course, they are end-users of the object of co-creation, hence part of the target group of the solution, which is needed to reach an acceptance of it and whose needs this solution should meet. Therefore, the participation of users is also linked to the quality of a co-creation output, especially regarding its suitability. As a result, their inclusion may also provide legitimacy for co-created solutions. In some cases, external stakeholders were even invited to co-create (or “co-produce”; Brandsen & Honingh 2018) on the executive level of a project, e.g. when they are engaged as experts for their user-knowledge in carrying out services for the target group they are part of (e.g. at *PIKSL* persons with learning difficulties are engaged as experts in the labs). Furthermore, users also serve as co-producers of the implementation of a co-creation output. This was done in *Ilona - Robot Brings Joy in Elderly Care* where care-workers were both end-users of a service robot and those implementing the new practices in care-homes. With a similar function, participants in some cases are also intended to serve as accelerators for systemic change by developing a new participative culture beyond the activity itself in its target area. On a smaller and individual scale, they are sometimes also included in a co-creation process in order to create awareness for certain topics amongst them (e.g. the need for heat-reduction, *10:10's Heat Seekers' Quests*). In such cases, co-creation is also an instrument for learning, hence has a function itself of creating intended side effects.

While the selection of participants is sometimes starting from the perception of their relevance and suitability by partners and due to their specific interest in a co-creation activity (e.g. the involvement of students for their future development; *Ilona - Robot Brings Joy in Elderly Care*), there are also approaches that try to achieve demographic

representativeness to collect a sample representative for a certain area (e.g. *Sciencewise – Involve and UK Government BEIS*). Together with cases that, for instance, feature dedicated stakeholder mapping procedures, such cases follow an approach where the selection of participants is relatively structured. Well-structured guidance for action can also be part of such structured invitation processes, as in the *MARINA* project. Here, procedures were explicitly suggested in order to be able to reach participant target groups individually. For example, experts for lectures were suggested to be addressed personally (i.e. via telephone or in-person). At the same time, part of the recommendations included more general information on how participants should be selected, so there was an explicit call to grant access to unexpected individuals and opposing groups.

In contrast to such cases, there are also examples where a very open selection of participants is taking place, for instance, open to anyone from a specific area. The same is true for cases where even spontaneous participation in co-creation is made possible, enabled by a concrete spot like a physical (lab-) space and an ‘open door policy’ for participation rather than (only) closed events. Another pathway found in the practice of cases for participation basically open to all is exemplified by *ninux.org*, where even completely anonymous co-creation is possible due to its decentralized network approach that is not necessarily demanding identification.

### *Invitation of participants*

When it comes to the process of invitation, external stakeholders are addressed to co-create by a variety of means characterized by different levels of individualization. While in some cases participants were personally invited (e.g. by direct appeal, e.g. *Fine Feathers Make Fine Birds*) or even ‘directly at the door’ in a relatively time-consuming and persistent procedure; *Engineering Comes Home*), other projects decided to launch calls addressing specific groups in general or even the wider public in a very open approach. These different pathways and levels of individualization were usually chosen due to the projects’ focuses.

Local projects with the aim of reaching local or topic-specific external stakeholder groups successfully chose personal contact or access via specific communities. In the rather locally oriented project *U-Bike (Sharing City Umeå)*, however, participants were even reached via a single post on a social media platform (Facebook), so that direct contact was not necessary, likely because of the participant target groups’ high interest in the project. Projects with a broader focus, on the other hand, addressed potential participants more openly, whereby it is often not possible to address them directly without considerable use of resources. When

it was possible to rely on the support of earlier contacts with good access to potential participants or it was even possible to access peer communication, the invitation was usually successful. Similar to that, the integration into strong networks and strong partnerships with actors that can provide access to the participant target group is also helpful for a successful invitation of co-creators. In such cases, sometimes individuals in key positions to reach out to the participant target group are supporting the invitation process. Hence, there are examples found in the cases where a planned identification and engagement of multipliers was realized in order to enhance the invitation process. At *Making Sense*, e.g. community champions were identified or members of a target group were intentionally included in order to promote an activity (e.g. students in schools, *MARINA*). The same applies to partnerships with actors who, due to their popularity or reputation, can give access to desired co-creators better than an activity itself. An example of this is the involvement of a municipality in the organisation of a co-creation process, which probably led to the engagement of other organisations at *Ilona - Robot Brings Joy in Elderly Care*.

In principle, it can of course also be the reputation or affiliation of an activity itself in a certain context that enables easier access to the participant target group. This applies, for example, to projects that, as part of an organisation, have easier access to participant target groups from other organisational units or a good reputation of being a successful provider of co-creation activities.

All in all the success of invitations to co-create is also depending on the context. For instance, it can be important whether a different, participative approach to problem-solution is accepted or not (see the chapter on the context of co-creation) or which groups are more likely to participate due to prevailing social norms in a context (e.g. boys; *Será que o mar vai engolir o Bairro?*) Furthermore, engaging professionals for participant engagement also seems to be a promising pathway. These can, for instance, science communication experts as in the case of *SPARKS – Rethinking innovation together*. Another rather traditional strategy to engage the participants (e.g. in research) found in the case of *Engineering Comes Home* is the provision of monetary incentives. While this might be a promising approach, not all co-creation projects will have the necessary resources and not all target groups will be interested in payment. Furthermore, paying participants for their participation might also be a misleading incentive as it generally contradicts the goal of achieving participants' ownership of the final solution. Hence, considering the interests of participants, addressing the function of a co-creation process for them might be another

strategy to consider for the successful engagement of participants. If a clear communication of a project's benefits for the different participants is already part of the invitation process, reluctance to engage can be addressed. The same applies to the consideration of their specific needs. While individual citizens might need to be addressed for workshops taking place at times they are available, other participants (like policymakers in *MARINA*) might only have scarce time resources and might, therefore, be more successfully invited to clearly communicated rapid activities.

Overall, the analysis of cases with a successful outreach to participant target groups suggests a reasonable amount of resources (be it human resources, time or financial resources, etc.) to be invested in the engagement of external stakeholders, as access to them is obviously not always easy to achieve in practice, despite some examples where no major hurdles were named.

### ***Design, Methods and Tools***

Analysing the cases, the presence of design has been identified on two different levels:

- 1) At first, the **design and planning of the overall activity and initiative** and;
- 2) Secondly, the **single co-creation activities** conducted in different stages.

In this section, the second level will be discussed.

#### ***Design of co-creation***

Prior to the individual co-creation activities, the different general approaches towards the entire initiative have to be considered. On the one hand, there are cases combining a variety of different co-creation practices on various levels also related to the general approach of the organization. This aspect can be exemplified with the *PIKSL* project, where co-creation is described as “an overall working principle” that has been identified both on an administrative and the single project level. Hence, such projects combine both levels previously mentioned having co-creation as a core element of the entire project design and its application in single activities.

On the other hand, there are also projects that use co-creation more selectively and punctually, for instance only for single stages of a development process (e.g. only in early stages, *Sciencewise – Involve* and *UK Government BEIS*). Most cases tend to co-create rather implicitly, which means that the concept of co-creation itself is not the main guiding principle in the practice of cases in the sample. Much more, related approaches and visions

are mentioned, such as user-centred design, design thinking, or participatory approaches in more general terms, for instance, citizen involvement concepts like the Aarhus Model for *Urban Mediaspace Aarhus Project – Dokk1*.

Some of the projects designed co-creation as a quite open process, leaving much space for unexpected results (and even participants, see above). In other cases, the projects used relatively structured approaches, for instance, by clearly specifying a challenge for an initially identified topic and a pre-defined group of participants (e.g. business in *REMODEL*). Heavily pre-structured co-creation designs can possibly be related to the selective use of co-creation on individual stages: When, for instance, the idea generation phase is implemented without the involvement of external stakeholders or, more specifically, end-users, the topic for co-creation is already defined before initiating the process and leaving few room for the reaction and adaptation to unexpected insights and results. Such an approach seems to be more suitable for cases in which a single actor identifies a specific problem aiming to apply co-creation in the process of finding a solution, hence top-down projects in particular.

#### *Phases of co-creation*

When it comes to the concrete phases of co-creation, again, very different approaches can be found. Whereas in some cases co-creation is applied throughout all stages, other cases feature rather punctual approaches as already indicated above. Therefore, it must be stated that the development processes presented in the cases are not always primarily determined by co-creation. The application of co-creation was even described as “superficial” for one case (*Será que o mar vai engolir o Bairro?*). Hence, processes described in the cases are rather processes that are partly characterized by co-creation or applying it only in selected phases rather than driven by co-creation as a whole. Across the cases identified as selectively co-creative, there is no clear preference for the implementation of co-creation in individual development phases. For instance, there are examples where only early stages were co-created (e.g. problem-identification and ideation; *SPARKS – Rethinking innovation together*). In other cases, solutions for pre-defined challenges were co-created and sometimes ideas for pre-defined challenges were proposed by individuals and solutions are later tested together with external stakeholders, while being created by the team. Furthermore, at *Ocean Living Lab - Smartifier Case*, primarily the diffusion of the created output was co-created. Hence, co-creation in this case had an emphasis on a phase after those related to the creation of a solution.

Furthermore, most cases are featuring an adapted design cycle approach, where single phases are carried out differently to the co-design cycle defined and used in SISCODE (e.g. Identification of problems and idea generation — co-creation of solutions — implementation; *Innovation Loop Region Västerbotten*). Additionally, there are also cases, where (co-) creation is not following an explicit cycle, being limited to single phases for instance (e.g. the ideation phase; *NESTA - Everyone Makes Innovation Policy - 10:10's Heat Seekers' Quest*). Moreover, iteration is happening between and across different stages. Sometimes, the whole cycle is iterated, sometimes, there is iteration between single phases and sometimes there is iteration within a single phase as exemplified in the following sections. However, while not all phases are always clearly distinguishable and sometimes blur, iteration can also not always be clearly assigned to single phases. Hence, the practice of iteration is highlighting the creative and non-linear pathways co-creation can take in different contexts and situations.

### *Problem identification and understanding*

The initial idea to focus on a topic and a specific problem is coming from a variety of different sources across the cases analysed. Sometimes, topics and problems are identified and understood without any kind of involvement of end-users or even external stakeholders at all. When there is no or only scarce inclusion of end-users, problems are basically identified and understood top-down (e.g. by partners of the project) or in collaboration with experts or decision-makers (e.g. public administration; e.g. *Sharing City Umeå*). However, in such cases, it remains a bit unclear whether there was really no end-user-involvement at all due to the inevitably limited information available. Of course, it cannot be ruled out that an informal exchange of information with directly affected actors of the respective problems has taken place in such cases. In other cases like *ninux.org*, a group of actors affected by a problem is involved in clearly identifying and framing it, starting a bottom-up co-creation process, which does not necessarily mean that there cannot be any support in later stages. Furthermore, there are also cases, where there is already a co-creative starting point with contributions of both actors directly affected and actors observing a problem without any (direct) relationship to it (e.g. with a human-centred design approach; *Mirrorable*) or where users are invited to articulate their demand (e.g. healthcare actors in *inDemand*).

In cases where problems were identified together by multiple actors, this was not always done in a structured form like a workshop or via a platform. Much more, sometimes



problems came up in earlier contexts – for instance when the respective co-creation process is a follow-up. Such cases, where the problem identification had happened prior to the process had started in a formal manner; indicate that there is a bandwidth of rather structured problem identification phases and rather ‘fuzzy’ phases.

When external stakeholders are already engaged right from the beginning, this can be linked to a holistic approach, where e.g. full participation shall be achieved for democratic or idealistic reasons or to contribute to an inclusive society, like in the *PIKSL* project. The same applies to approaches where there is awareness for the potential of early participation of external stakeholders for their acceptance of the final solutions aiming to improve their quality and assure the relevance of the problems addressed.

### *Ideation*

Similar to other phases, not all cases include a clearly distinguished ideation phase and it is sometimes merging with phases coming before or after. Furthermore, the ideation phase in the practice of cases is also characterized by both structured and informal or open approaches and mixed ones, again. The use of explicit methods is one instrument utilized to structure the ideation process. For instance, sometimes hackathons are used to frame the ideation phase, which do not necessarily need to be limited to the ideation phase only, again highlighting the blurring of different phases in practice as they are realized within one single event. Basically, workshops do play a strong role also in this phase, where e.g. discussions and group work (hence co-creation in smaller teams) are happening with the support of methods like visualizations and creation of sketches or tools like tangible materials. For the ideation phase, also competitive formats as seen in the case *Smart Kalasatama Well-being Centre* are relevant, where, for instance, prototype-ideas developed in groups are competing against other ideas.

Similar to the observation for the initial co-creation phase, there are also cases in the sample where the ideation phase was realized without an articulated inclusion of end-users. In such cases, ideas were, for instance, elaborated by the project board and later discussed with broader audiences (e.g. *Fab City Grand Paris (FCGP)*). *Sharing City Umeå* provides another example, where policies were already providing the idea for the solution to be developed. Hence, in such cases end-users rather have the function of providing additional knowledge in this phase rather than to ideate entirely new solutions together with other (external or even internal) stakeholders.

### *Prototyping*

Slightly different to the earlier stages, a clearly defined prototyping phase was found in various cases and was often named explicitly and sometimes even as the main stage of application of co-creation as exemplified by *E-FABRIK*.

While end-users were not taking part in the prototyping process in all cases in the sample (e.g. *Medialab Prado*), they were still included in most of them. There were also different levels of participant involvement noted in this phase. When not fully engaged in creating a prototype, for instance, they were confronted with first solutions for their articulated challenges in order to give feedback and to support the further development of them (e.g. *inDemand*). The prototypes in the different cases have various shapes ranging from tangible to intangible depending on the development process and the desired outcome. However, intangible prototypes were often combined with tangible material in order to support the prototyping phase and the understanding of users (e.g. low fidelity paper prototypes, *The Australian Centre for Social Innovation (TACSI)*). Examples for the variety of intangible prototypes are found with e.g. mediation prototypes, concepts (e.g. for a project, *REMODEL*), scenarios, services, or software. Even if tangible outcomes are the intended final result, prototyping stages can be limited to the creation of concepts – for instance, to realize tangible outputs based on the documentation in later iterations or follow-up events like in the case of *Medialab Prado*. Prototypes were also realized for new practices, which were, for instance, linked to tangible artefacts (e.g. a hammer, a book, and other artefacts as parts of a learning tool to address injustice; *Lab of Collaborative Youth (LoCY)*). Regarding tangible prototypes, a wide variety has been found ranging from preliminary drafted material to quite final products like textiles used in co-creation of clothes with the target-group (*Fine Feathers Make Fine Birds*) or both hardware and software.

Furthermore, some prototyping phases were also designed to be competitive, continuing competitions started in earlier phases in an overall competitive co-creation framework (e.g. *Smart Kalasatama Well-being Centre*).

### *Verification and Testing*

While the last phase of verifying and testing can be essential for triggering iteration and laying the ground for a refinement of a prototype, it is not always mentioned to happen in the cases, for instance, when there is not enough time left to test the prototypes as it was found in the Case Study for *Fine Feathers Make Fine Birds*.

While workshops are, again, the most common format in the cases, the testing is not only happening in ‘closed’ contexts. Sometimes it is also carried out in real-life conditions (e.g. *Extreme Citizen Science’s Intelligent Maps Project*), though not necessarily following a living-lab method in the sense of earlier approaches (“first generation”; Edwards-Schachter 2019), where a main focus is on “moving research from in vitro to in vivo settings in simulated or real-life contexts, e.g., testbeds” (Edwards-Schachter 2019, p. 139).

Especially in the last stage, discussed in this section, end-users are involved together with experts, potential clients, and others. Generally, testing and feedback processes in the sample can also be divided into two levels at least. On the first level, end-users or other external stakeholders provide their feedback after an introduction (e.g. a presentation or a document). Hence, they are not testing the prototype on their own, but in a guided procedure. Of course, this might not always be possible, for instance, when a large-scale strategy for an intangible outcome is aimed at, it often can only be evaluated after implementation and testing under real-life condition might have negative impacts on target groups of the solution if the prototype is not sufficiently developed or needs too much refinement. On the second level, end-users and others can really test a prototype in use, though not necessarily under real-life conditions.

### ***Evaluation and stakeholder feedback***

As shown before, feedback from external stakeholders (not necessarily end-users) is collected not only in the final testing phases of a prototype but also throughout earlier phases. The evaluation framework for collecting feedback and measuring the projects’ success is realized by the different actors and tailored to the specific project: sometimes it is conducted by team members (e.g. the lead partner), sometimes external experts are in charge and sometimes, the evaluation is even co-created – at least to a limited extent. *Ocean Living Lab - Smartifier Case* provides an example for co-created evaluation tools found in the cases, where questionnaires were developed together with participants in dedicated workshops.

As much as the evaluated co-creation phases and the outputs differ, also a variety of means have been identified. For instance, when it came to collecting feedback and perspectives on their co-creation experience from participants, both relatively closed methods like surveys or questionnaires and more open methods like interviews or focus groups were utilized. End-users and external stakeholders in more general terms were included in prototype testing procedures (see the section on testing above). While evaluation was only realized punctually in some cases (e.g. only for collecting feedback on prototypes), in other cases it was addressing the full co-creation process, its effectiveness and the satisfaction of actors. Hence, the participation of external stakeholders (e.g. the demographic representativeness; *Sciencewise – Involve and UK Government BEIS*) and the role of stakeholder typologies as well as individuals (e.g. personalities, team configuration; *Museomix*) were measured. Furthermore, framing aspects like the chosen time-frames were reviewed and a reflection on overall drivers and barriers has been made in some cases in order to give recommendations and directions for follow-up activities (e.g. *Mirrorable*). Taking a macro perspective on the projects beyond their internal processes, also the sustainability of the co-created solutions and their impact were measured. At *Medialab Prado*, for instance, learning outcomes for co-creators were measured in an informal manner by a collective reflection activity. Furthermore, the feedback was also collected in evaluative measures in order to collect data for (scientific) research. In the case of *SPARKS – Rethinking innovation together*, data from external stakeholders was collected in order to understand the impact of its approach and success factors for co-creation between science and civil society.

### ***Communication in the co-creation process***

Communication throughout the process seems to be a crucial factor of success for co-creation initiatives. Its relevance is highlighted in cases where communication partly failed and turned into a barrier. Generally, the cases reveal that communication needs to be comprehensible, direct, and clear for all participants. This aspect applies to different levels: choosing the right (native) language, using a comprehensible style of language, and leaving enough space for communication when there is a need, for instance, due to conflicts between different participants. Choosing the right native language might appear a bit trivial but especially in the case of *Extreme Citizen Science's Intelligent Maps Project*, it was particularly crucial to use the right local language of co-creators in order to achieve understanding whereas English would not have been appropriate. Furthermore, in this particular case, it also appeared to be helpful to choose rather visual forms of communication. The latter already points at the observation that communication in co-

creation is also linked to the communication of knowledge necessary to understand a problem and develop the object of co-creation. Especially complex expert-knowledge sometimes needs to be broken down to a level that is easier to understand for laypersons.

### ***The role of methods and tools***

For analytical reasons, first of all, co-creation tools need to be differentiated from methods. In the following sections, co-creation methods are understood as means that determine a process and provide a framework. Tools, in contrast, are understood as means directly supporting or enabling the co-creation practices. However, as detailed in the following sections, tools and methods are not always clearly distinguishable. Hence, when a tool was mentioned in the cases it might sometimes rather be a method than a tool as it is not only supporting practices linked to a framework (i.e. method) but also provides a framework itself. Whether tools are described as tools or methods seems to also depend on the perspective – a functionalist perspective on a method might lead to an understanding of it as a tool.

### ***Methods***

Overall, the cases are characterized by the variety of methods applied; only workshops appear to be a very common and widely seen method to provide a playground for co-creation across all phases of development. Apart from this, there are hardly any other methods that appear to be really specific to co-creation across the variety of cases. Still, there are some methods that were described repeatedly. Besides workshops, surveys and interviews were identified throughout different stages of co-creation (e.g. in initial stages to identify a problem or in later stages to verify/evaluate a prototype). More generally than workshops, events, in general, were the main method used to provide a framework for co-creation. Such events were, for instance, exhibitions. However, these were often used to present co-creation outcomes while at the same time being a space for co-creation itself (e.g. *Museomix*). Other kinds of events were identified as hackathons (e.g. *The BrainHack Project*), which could, of course, also be described as a more specific but (process-wise) open form of a workshop. Furthermore, conferences were also seen in a couple of projects, especially utilized for dissemination.

However, as conferences are a common type of event especially in academia, their application in research-heavy co-creation cases seems in line with the general orientation of those initiatives. When having a closer look at the variety of events, different methods

were also utilized to facilitate co-creation. Among these were both methods determining the whole co-creation approach within an event and beyond as well as such methods used interchangeably or complementary to each other. For the first type, design thinking is probably the most popular and striking approach giving structure to co-creation. While it is directly building a bridge to the use of design tools and methods, it is also putting users in focus and at the same time probably also the main reason for explicitly following a (co-) design cycle despite the variety described in the section on co-creation phases. This assumption is in line with the finding of SISCO's analysis of 11 labs in SISCO D4.2, where design competences were found as a major reason for projects (i.e. labs) to complete a full design process from the early phases throughout the entire process of development to its conclusion. For the second type, there is no method preferably used across the cases, which might be due to their interchangeability. For instance, some cases organized round table discussions while others realized open discussions in more general terms.

Whereas workshops and other events often provide the playground and a framework for co-creation, there are also completely different approaches in conducting those. *Ninux.org*, for instance, presents a completely de-centralized approach of co-creation without any necessary direct, physical contact between participants. Moreover, co-creation was also brought into practice outside of clearly defined events. This was especially found where (field) research was co-creatively realized (e.g. *NESTA - Everyone Makes Innovation Policy - 10:10's Heat Seekers' Quest*) or where prototypes were tested under real-life conditions (e.g. an app in *Extreme Citizen Science's Intelligent Maps Project*). Furthermore, co-creation has also been found to be happening on operative levels, for instance, where an organisation is (also) co-creatively developed (e.g. *PIKSL*). Such activities do not necessarily need to have fixed formats for co-creation but can also be realized in the managerial practices, which are characterized by co-creative governance forms.

### *Tools*

Tools used in the co-creation cases are not only utilized to support co-creation in practice. In some cases, they are also the result of co-creation. Tools that are facilitating co-creation are both, tangible (e.g. paper prototypes) and intangible (e.g. videos). Second, such facilitating tools were chosen, applied, and further developed, sometimes supported by a range of existing material from knowledge repositories to exhibitions. Furthermore, tools were also utilized or even developed as part of the solution to the problem addressed by co-creation. Just as previously stated for the methods, the tools are used for very different

scopes. They are applied for different reasons: for instance, to provide knowledge (e.g. knowledge sharing platforms), to facilitate communication across distances (e.g. e-mail), to create better understanding of ideas or first solutions (e.g. tangible prototypes), to share ideas (e.g. canvas) or to make evaluation possible (e.g. surveys) etc.

What is striking across all cases and on both levels is the relevance of digital tools, both hardware, and software. In the cases, the hardware is a supportive tool enabling co-creative practices (e.g. smartphones, cameras, 3D-printers) and the object or output of co-creation (e.g. a service robot in the case *Ilona - Robot Brings Joy in Elderly Care*). Sometimes, the hardware is also both the same time: the object of co-creation and a supportive tool for it. This is possible when co-creation is happening on different levels at the same time and aiming at both, new practices and a tool supporting these practices. For hardware, *ninux.org* is presenting such an approach, where co-creators co-create a network by collectively building and providing network hardware (e.g. antennas) and use it at the same time to co-produce the network and also to communicate with each other. The same can be true for software, for instance in the case *Extreme Citizen Science's Intelligent Maps Project*, where an app was co-created and, at the same time, is also the basis for co-creation of a map.

### ***The dimension of space as a resource for co-creation***

When looking into the cases, primarily two different forms of space are important to understand co-creation in practice: Physical and virtual space. The first can further be divided into physical space as a resource for co-creation activities and physical space as a geographical area. As the latter is addressed in the chapter on contexts, in this section the function of concrete physical spaces is addressed. Virtual space as the second form is often important for dissemination activities but also providing an opportunity and potential alternative space for co-creation. As the function of virtual space for dissemination is closer looked at in the section on dissemination (4.3.3), in this section virtual space will also be discussed as a place for co-creation.

In some cases, both a geographical area and specific rooms or realty are in focus. This is found, for instance, when a district is developed via means of a physical lab situated in a geographical area providing the target group of the solution, hence also the co-creators (e.g. locals of a neighbourhood in Rome, which was the target area of the activity at the same time; *Ecomuseo Casilino ad Dues Lauros*). Rooms and realty in the cases are first a resource for co-creation as they provide the necessary space for realizing activities. In some

cases, physical rooms are providing the space to meet physically and where necessary tangible tools are available. This aspect is especially true for lab-contexts like those of FabLabs. It also applies to other cases, where space is also needed despite not primarily used for accessing tools or as a meeting point. Much more, the *Centre for Social Innovation (CSI) Toronto* provides an example, where co-working is realized in rooms that are provided by the organisation enclosed in the case.

As already mentioned in the section on stakeholder engagement procedures, physical space can also provide access to co-creation projects and space of encounter for different external stakeholders. This is possible when they are provided with the opportunity to physically join co-creation activities or suggest new ones in a physical space (e.g. *Library Living Lab*). Hence, such a physical place is also intentionally used to have a contact point for individuals in a project's target area – e.g. a city district. This applies to both, single rooms and even complete buildings or areas. In some cases, labs and buildings also turned into the object of co-creation. For instance, at the *Urban Mediaspace Aarhus Project – Dokk1* a new library was built and its new concept as an urban media space was the object of co-creation. Another example is presented by *Borgerne Hus (The Citizen House)*, whose concept was also co-created and which is now also the hosting space of additional co-creation projects, just as it is the case with *Urban Mediaspace Aarhus Project – Dokk1*.

In some cases, also virtual space is used to co-create or, as for the physical space, can become the object of co-creation itself. In practice, this is done via virtual platforms or even virtually beyond but with the support of a platform – for instance, when a network is co-created by individuals in parallel with a virtual platform used for communication. (*ninux.org*). Virtual space is also used for communication between internal stakeholders of the projects, for instance, via private messengers, e-mail, discussion forums, and other means. Hence, virtual space can be an important enabler of co-creation and management of co-creation over distances. The same applies to the use of virtual space to communicate knowledge (e.g. via platforms) necessary to realize co-creation of solutions for rather complex issues or with complex co-creation outputs.

### ***The dimension of time in co-creation processes***

Time plays a crucial role for co-creation in the cases analysed in this chapter and is often a relatively scarce resource. First of all, many cases are based on time-limited projects and some of these are struggling to continue or institutionalize the co-creative practices beyond this time-span. Furthermore, when projects are time-limited so are often the single co-



creation phases or the whole co-creation process. As a result, some stages cannot always be finalized and in some cases need to be continued after the activity, which does not always happen – for instance, due to a lack of time and funding for realizing a testing phase with user-feedback (e.g. *Fine Feathers Make Fine Birds*). With very different time-frames available, the cases also feature very different time-spans for single co-creation phases and single workshops. Some phases and processes among the cases are particularly compressed and some are even notably extensive. Of course, these different time-frames are not always tracing back to the limited time available for projects. In some cases, for instance, rapid prototyping was realized in order to achieve results quickly. Overall, limited time frames are not always a restriction and related to limited funding periods but also to the goal of having first (i.e. prototypes) or final solutions on time – for instance, in order to have a solution for a policy goal set for a specific year (e.g. having solutions for more sustainable transport practices by 2025; *Sharing City Umeå*).

#### **4.3.2. Further Development of the Co-Creation Process**

The co-creation processes described in the cases are developed to different extents. Their development and establishment of partnerships and networks and, sometimes, follow-up activities are defining the scalability of their approach or even trigger a change in a larger context (i.e. ‘system’). At the same time, also the co-creation process is further developed while being carried out. Partnerships and networks are not only developed to sustain but also to put co-creation activities in practice in a collaborative environment. Furthermore, there are complex issues and critical turning points in some activities that can be addressed by further developing and adapting the process itself. Hence, in some cases, there were also stabilization phases observed that even led to (newly) established routines.

#### ***Development of partnerships and networks for collaboration, diffusion and sustainability***

The partnerships identified in the cases are both of formal and informal nature. As many cases in the sample feature limited-time projects with formal consortiums, partnerships and collaboration in these cases were necessarily formalized. Similar to that, there were also cases where partnerships were also formalized by contracts. This was done, for instance, in cases where external experts were needed to contribute their knowledge and skills. Informal partnerships were also named in the studies of most cases. Especially when a co-creation project—not matter if it is a formal project, a network, or an organisation – is in its development phase, informal partnerships arose that were also the basis for later

collaborations and co-creation. However, informal partnerships and collaboration were also observed in the cases when co-creation was already in its realization phase. Similar to formalized partnerships, resources were provided due to formal agreements, external stakeholders were supporting the activities informally with different resources, for instance with volunteers, hence human resources. However, such volunteers did also engage individually, for instance, due to their experiences in the co-creation process and their willingness to support follow-up events (e.g. at *Museomix*). Furthermore, (relatively) informal collaboration is also the basis for both the management and co-creation in the *ninux.org* network, where no formal membership is necessary to build a digital network by a network of decentralized co-creators.

As already indicated, both formal and informal partnerships networks and collaboration are crucial to access necessary resources as human capital, knowledge, funding, rooms et cetera. Furthermore, networks and partnerships especially have a key function in providing access to external stakeholders (see sections on stakeholders), realizing their participation, getting their feedback, achieving their acceptance, and so forth. Additionally, strong partnerships developed in the co-creation cases do not only provide resources and support for co-creation activities while running but also beyond. In successful cases, networks or partnerships still sustain and further develop after the end of time-limited funding. This was, for instance, the case with *Apulian ICT Living Lab*, where successfully built partnerships were continued as a new business or new labs. Furthermore, the establishment of networks or communities sometimes also leads to scaling an activity via adaption to other contexts by other actors. Hence, in some cases, communities were actively built by teams around an approach in order to establish co-creative practices beyond the activity (e.g. to have ongoing use of the *Library Living Lab* for new co-creation activities by this community). On the other hand, when networks or collaboration are not strong enough, they might not sustain and there might not be any follow-up activities. In the *SPARKS – Rethinking innovation together* project, for instance, partnerships and collaborations between different actors were built and they were co-creating. After the time-limited project ended, it was not clear whether these collaborations and partnerships sustained. As a result, dedicated resources and competences for building networks, partnerships, communities, and lasting collaborations can be an important driver. Hence, in some cases, there were even experts engaged for this function, and other cases benefitted from the community-building skills of the main partner (e.g. *Fine Feathers Make*

*Fine Birds*). However, as found in the *PIKSL* project, maintaining partnerships can also be time-consuming and a challenge for management teams with limited resources.

Networks, partnerships, and collaborations found in the cases enclose actors from all four helices of knowledge production described by Carayannis and Campbell (2009). However, as explained in the chapter on the co-creation process, the support of all of these sectors was not necessarily intentionally oriented towards the aim of having all sectors from the quadruple helix collaborating in the project. Much more, this observation emphasizes the general willingness of actors from different societal areas to support co-creation. However, this is of course also depending on individual actors and the respective context (see chapters on roles and contexts). Hence, there are also differences in the success of achieving partnerships and collaboration to support co-creation depending on the themes and contents and their compatibility with the aims of the desired partners.

Networks and partnerships found in the cases have all kinds of different sizes and scope. There are large international, medium, and small local networks. While this is, again, linked to the respective themes and contents of co-creation and their compatibility to those of the networks, this observation still basically indicates a broad support landscape for co-creative approaches, even if not for all themes, not in all contexts and often not formalized (e.g. into funding schemes like in the European Union).

### ***Scaling and Diffusion***

Generally, actors within the cases of the sample mostly strive to continue the co-creation activities in one way or another after the conclusion of the initial project. Sometimes this is due to the necessity of having a dissemination and sustainability strategy for complying with funding scheme requirements. However, teams do also establish framework conditions for sustaining their co-creation activities even if there is no clear requirement by funders, hence probably reveal a personal interest in the activities (see also the section on the starting points). Moreover, also external stakeholders engaged in the co-creation processes sometimes want to continue co-creation or keeping partnerships and communities alive. Basically, three different forms of continuation and scaling can be distinguished across the cases despite them being sometimes mixed forms in the practice of cases: follow-up activities, scaling, and systemic change.

First of all, **follow-ups** are the most seen form of continuation within the cases. This statement applies in particular because many of the co-creation cases already carry more

than one activity within their life cycle or within their process – for instance, continued workshops. This also applies to the co-creation of organisations and networks if they are co-creatively developed further - which is also a form of follow-up. Furthermore, partners and participants were continuing outputs of the co-creation processes on different levels. For instance, research partners published their findings and co-creation activities were sometimes even scaled into new organisations that were continuing co-creation processes on their own responsibility. Among other examples, the latter was found in the case *Apulian ICT Living Lab*, where business was taking up the living lab approach. In general, cases that were able to **scale-up** were more often following a broader approach, for instance within an organisation like *NESTA* or *TACSI (The Australian Centre for Social Innovation)* that is providing co-creative or similar activities for a variety of themes and target groups with a greater objective in sight rather than a single project. In other cases, successful co-creation processes were scaled up by applying the approach to other, different contexts. Sometimes, the successful scaling of co-creation processes led to the foundation of a formal organisation (e.g. an association, *Fab City Grand Paris (FCGP)*), hence also resulted in institutionalization. However, while there were a couple of cases scaling-up, there were more cases where options for scaling-up were mentioned. Among these cases, there were also quite a few examples where these options were not selected – of course also because they were rather hypothetical or suggested by the Case Studies rather than by the cases. **Systemic change**, on the other hand, was often basically addressed in the cases in a sense of changing practices, norms or values in a larger context, be it in organisations, regions or internationally. The goal of supporting systemic change was often addressed by activities aimed at creating awareness – for instance for the value of co-creating policies in a public administration (e.g. *Social Innovation Lab Kent (SILK)*) or for the role of specific vegetation across countries in an international region (*LTsER Montado*). However, although many cases were generally addressing change in larger contexts, achieved systemic change was very scarce. It is more often achieved in smaller (e.g. local) contexts, when communities are taking up co-creative practices or when practices in an organisation are being influenced – for instance in public administration as exemplified by *Social Innovation Lab Kent (SILK)*.

### ***Challenges to realize co-creation and solutions***

Co-creation activities in the sample were facing different challenges and, at the same time, identified different strategies to address and tackle those challenges – sometimes more and

sometimes less successfully. Among these different challenges especially hurdles related to participant interaction were repeatedly reported.

Such challenges were, for instance, related to a traditional mind-set among participants hindering successful co-creation and making it difficult to fully apply co-creation as a principle. This was observed for instance, when co-creators did not consider the larger picture although this was necessary for the respective activity as it was addressing a meso or macro level. For instance, this was the case with *Ecomuseo Casilino ad Duas Lauros*, where such mind-sets appeared as an obstacle. Similar to that, participants in some cases wanted their aims to be considered above those of others. For instance, conflicts arose when core interests of different participants were contradicting each other; hence a mismatch of interest was obstructing co-creation: such core interests can be related to different rationalities like organisational missions – for instance, contradicting profit-making approaches like those of tourist industry versus those of oil industry as exemplified by the case *Library Living Lab*. For some cases, it was also mentioned that professionals were challenged by accepting the relevance of lay knowledge, hence knowledge from unusual and non-formalized sources. Furthermore, also a lack of perceiving ownership of solutions was occurring in some cases, especially where participants were not part of the full co-creation process but only in selective phases like later ones. In *Borgernes Hus (The Citizen House)*, intensive dialogue and the creation of a shared vision and hence a perception of ownership by co-creators successfully addressed the challenge of initially incompatible interests and mismatches in more general terms. However, a major learning in this case was also that it is important to include representatives of all external (or even internal) stakeholders in co-creation as early as possible in order to ensure a perception of ownership. Furthermore, shared understanding among participants was also achieved by means of co-creation itself, hence by understanding challenges and needs together, working together and creating solutions together as described in the case of *Smart Kalasatama Well-being Centre*. From this perspective, participants in co-creation are getting to know each other and learn to collaborate in the practice of co-creation. Another recurring barrier to successful co-creation was the successful communication of knowledge and complicated themes in more general terms. In some activities, there were concepts not familiar to all co-creators, which led to complications when these concepts were not familiar or well-known so far (e.g. RRI in policymaking in *SPARKS – Rethinking innovation together* or new models of collaboration by means of labs as found for *Medialab Prado*). Hence, this challenge again highlights the importance of identifying, ‘translating’ and

sharing necessary knowledge for co-creators (see also the section on communication in the co-creation process).

However, despite the different challenges to co-creation related to different kinds of mismatches between participants or between them and themes or knowledge, in some cases, there were no mismatches perceived at all.

#### **4.3.3. Organisation and Management**

##### ***Overall design of the activities***

While the process of co-creation is often intentionally designed, also the overall project-level can be understood as an object of design. Project designs across the cases are very heterogeneous; hence, these cases are representations of a variety of approaches to deploy co-creation in practice.

All different kinds of project designs are closely linked to the goals that are guiding the activities in each case. Hence, the project designs can also be understood via their function for the internal stakeholders. On the one hand, there are project designs that primarily seek to develop solutions for identified problems, such as new services, new infrastructures, strategies or policies, new business models, or tangible artefacts. Among the cases, there are also project designs that conduct collaborative research and incorporate co-creation approaches and activities. The projects are aimed at different target levels and not only want to deliver concrete outputs but also to achieve social impact or outcomes-oriented towards the target group of the solution. The project designs are also geared towards whether, for example, capacities should be built among participants (e.g. competences; *E-FABRIK*) or new practices should be established in a specific context (e.g. more sustainable ones; e.g. *Engineering Comes Home*). On the other hand, there are also project designs that focus on the co-creative development of an organisation. When looking at the cases, co-creation in the sample is sometimes also aimed at both levels at the same time, e.g. they address the co-creation of an organisation and its services in parallel or one after another (e.g. *The Australian Centre for Social Innovation (TACSI)*). Hence, in these cases, co-creation seems to be a guiding principle for all activities conducted by a certain group of actors (i.e. internal stakeholders) as found, for instance, with the *PIKSL* project.

##### ***Organisational approaches and entities***

Like most activities of collective action, also co-creation activities are dependant on having some kind of formal structure. Most cases in the sample comprise projects or programmes influenced by different forms of organisations as well as initiatives conducted by networks with less formalized structures. However, some cases feature more of these types at the same time, for instance, being a network in the framework of a programme (e.g. *Sharing City Umeå*). Co-creation projects and programmes in the sample are usually time-limited, often funded by EU research framework programmes. They represent either single stand-alone projects, realized by a consortium of actors (of course there might be project-families in the funding-programme) or they are part of a series of similar projects/a programme themselves in an organisation with a respective focus or across different partners when follow-ups emerge or the approach is scaled. Organisations in the sample are ranging across a variety of different forms from public organisations (e.g. *Social Innovation Lab Kent (SILK)*) to NGOs/NPOs (e.g. *NESTA*), whereas traditional scientific institutions like universities are primarily found as project partners rather than conducting initiatives themselves. This also applies to business organisations, which tend to be rather co-creators or project partners than being the entity behind a case. Organisations in the sample are both co-created (e.g. *PIKSL*) or further developed in a co-creation process (e.g. *Urban Mediaspace Aarhus Project – Dokk1*) and feature co-creation projects and programmes while sometimes even being led in a co-creative manner.

Furthermore, networks are found in the cases. On the one hand, there are networks providing the administrative and operative structure for the co-creation activities, similar to an organisation. On the other hand, the sample comprises cases where networks were co-created in the activities. These networks can be described by two different types at least: Decentralized, loose networks of individual co-creators (e.g. *ninux.org*) networks of organized collective actors like public administrations (e.g. *Sharing City Umeå*) or labs (e.g. *Fab City Grand Paris (FCGP)*). Despite their differences, both types (networks of individuals and networks of collective actors) of course share a common vision and a common mission providing the basis for informal membership (e.g. *ninux.org*) and the reason for co-creation.

### ***Governance and management structures***

As most cases in the sample are focusing on projects or programmes and many of these are funded by externals, most of the cases follow rather structured governance and management approaches typical for funded projects. However, in the sample, there are

also some cases with quite loose and informal structures. In most cases, a clear division of labour with clear responsibilities characterizes the management. Whereas especially activities situated in bureaucratic environments like public administration are often featuring a rather closed sphere of management, in other cases, even external stakeholders are invited to co-manage the co-creation activities. Accordingly, governance in some cases itself was characterized by co-creation, hence a highly participative approach, where external stakeholders are invited to co-create managerial decisions like how to equip rooms in a user-centred design approach (see *PIKSL*). In cases that are realized collaboratively or co-creatively by different partners, these partners are coming from a variety of sectors again enclosing the quadruple helix actors and beyond, just as it is true for the co-creators in the cases. As there is a number of research projects in the sample, there are especially research partners and probably due to the selection of cases, there is also a notable number of public administrations and organisations that are both directly or indirectly related to them. Furthermore, individual and collective civil society actors are also found in the cases on administrative levels. Of course, this was especially true for cases that were initiated bottom-up from a concrete social need - again this might be due to the selection of cases and the focus on participative approaches.

### ***Resources and budgets***

Just as other activities, also co-creation is dependant on the availability of resources. First of all, participants for the co-creation process are the most important resource enabling co-creation, of course. More generally, **human resources** are crucial in order to realize co-creation – be it for managerial purposes, to facilitate co-creation in progress (e.g. experts) or as staff of projects and organisations or as members of networks. Directly linked to human resources within the initiative is the importance of networks and communities as a crucial resource (see also sections on networks and partnerships) for accessing additional, external resources of human, financial and other kinds.

Another crucial supply for most cases is **knowledge**. This was especially true for activities where complex problems were addressed (e.g. linked to legal expertise at *Koori Justice Unit*) or where solutions were built on complex technologies (e.g. *The BrainHack Project*), practice-guiding concepts (like systemic design principles; *RETRACE – Interreg Europe Project*) or other complexities. In such cases, understanding among co-creators was addressed by different means, for instance by providing knowledge on sharing platforms, by inviting experts or by realizing discussions to clarify questions (see also the section on



communication in the co-creation processes). Of course, knowledge is also linked to individuals like experts and can furthermore be the basis for skills and competences of individuals needed to support and enable co-creation. Hence, the availability of knowledge can also be directly linked to the availability of human resources again.

When it comes to **financial resources** there is no significant difference found between the cases and other socially innovative initiatives. Hence, also the success of co-creation is highly dependent on the availability of financial resources that are often provided by external funders across the cases. In result, time-limited projects are facing the challenge of sustaining their activities beyond the end of a funding period. Therefore, there are both cases just as *Fine Feathers Make Fine Birds* that failed to continue their co-creation activity and cases that were able to acquire follow-up financing, new funding sources or that were even integrated and institutionalized in an existing framework, like *Sliperiet / Den Koldioxid snåla Platsen (The Low Carbon Place)*. Furthermore, also alternative funding modes were found in the cases. The *Centre for Social Innovation (CSI) Toronto*, for instance, applied a rather participative financing approach by raising investments from the community via their Community Bonds instrument.

Furthermore, there are **physical resources** necessary for most co-creation processes in the sample. Where physical meetings were providing the basis for co-creation, rooms were often necessary. While there were also activities happening on the outside (e.g. field-research), especially labs were often depending on the availability of space in form of rooms. However, across the cases, the availability of space did not seem to be an often found challenge at all. Much more, in many cases, co-creation in the sample was rather addressing new functions for available space – for instance, libraries. Nonetheless, there were also a couple of activities that had to find space for activities not rooted in a need for new functions and concepts of available space. However, space does not seem to be a scarce resource across the cases after all. When space needs to be acquired, it might much more be a lack of financial resources leading to hurdles and solutions like the *Centre for Social Innovation (CSI) Toronto's* community bonds. Another physical resource were tools necessary for co-creation. Especially different devices and machines were providing the artefacts bound to co-creative practices – for instance, 3D printers, smartphones, cameras, and so forth (see also the section on tools). As some of these tools had to be rented or bought, they were also depending on the availability of financial resources.

### ***Communication between project partners***

While communication between co-creators and with co-creators was a crucial factor for successful co-creation in many cases, there were also some findings discussed for the administrative level in some cases. Similar to the co-creation processes, knowledge also had to be shared between the organisers of the activities. In some cases, this was done by providing guidelines – for instance for invitation procedures in *MARINA*. In other cases, communication was realised via virtual tools in a very broad sense, ranging from tools for note-taking and task management (e.g. evernote) to virtual pin walls like Pinterest, instant messengers or simple mailings. Digital communication in general was crucial for the success of cases that were realized across distances and where the exchange of information had to be realized without physical presence. Similar to the co-creation processes, there was also the challenge of using the right language when partners of an activity were coming from different language areas, hence this was addressed by translating information into the necessary languages. Furthermore, information shared among partners or organisers also had to be comprehensible, hence translated into terms and logics of other domains. Actors from other domains with different logics just as public administration often did not understand design-led logics by default. Hence, in the case *Borgernes Hus (The Citizen House)* DDC as the partner with design competences had to invest significant time resources into translating from one logic into another.

### ***External communication and dissemination***

As already shown in the section on participant selection, invitation, and engagement, external communication was crucial for the cases in order to reach out to them. Generally, dissemination strategies are seen in many cases, hence realized by many different actors responsible for co-creation activities. In this respect, co-creation activities in the sample have often benefited from such targeted communication strategies. While such strategies were usually seen as an administrative part of the cases, there are also cases where participants were creating awareness and actively contributing to reach out to others and disseminate the activities. In some cases, these external stakeholders were intentionally selected for this reason (see also the section on the function of stakeholders in 4.3.1.). Hence, community champions or other multipliers were supporting access to communities. In the case *MARINA*, for instance, students in schools were addressed to fill this role. Moreover, dissemination was also supported by external stakeholders partnering with the projects, networks and organisations behind the cases. In such cases, they proved their potential for dissemination and were hence important drivers for not only reaching and successfully inviting possible co-creators but also for creating awareness for the

activities and disseminating findings, knowledge and solutions. Similar to that, awards and prizes for the projects were also seen in quite a few cases and were also supporting outreach and dissemination.

In order to reach out to stakeholders to participate in co-creation, to disseminate outputs of co-creation, or to make co-creation processes better known, again a variety of approaches, tools and methods was used but especially digital means were repeatedly utilized. Among these, own and external websites and social media were often used for dissemination. Examples were popular social media platforms like Facebook as well as websites of funders or partners. However, while some of these were successfully used in some cases, in others the use of similar strategies for diffusion via digital media was not as successful. For instance, in the case *Sharing City Umeå*, a relatively low effort already created successful outreach by means of a single Facebook-post although the participant target group was not even international but local. At the same time, websites were not always successfully used, hence sometimes considered as relatively inadequate means for reaching new possible co-creators, as mentioned in the Case Study of *ninux.org*. However, the success of utilizing digital means seems to depend on the respective strategies and approaches. Hence, as in other activities, experts for digital dissemination strategies might be particularly supportive for co-creation activities as well. In some cases, professional knowledge on how to realize dissemination effectively or earlier experiences with dissemination proved helpful – for instance leading to the successful establishment of a visible ‘brand’ in the case *Innovation Loop Region Västerbotten*.

Beyond digital tools, also peer communication proved successful in reaching out to external stakeholders (see the section on selection and invitation of stakeholders), especially supported by members of communities as already indicated above. Such approaches were primarily seen in cases where clearly delimited participant target groups were focused. Furthermore, also events were often used to disseminate the results of co-creation or to create awareness for its topics in more general terms. Beyond workshops and larger-scale events (e.g. conferences) also exhibitions had a function in this regard in some cases and were sometimes also the object of co-creation themselves (e.g. *Science Frugale*).

Overall, external communication proves to be an integral part of the co-creation projects in the Case Studies. Just as communication in the co-creation processes themselves and communication between project partners or organisers, it seems to be important for

successful co-creation to invest enough resources into dissemination and outreach to participants and end-users of the solutions.

#### 4.4. Comparing the starting point - the role of stakeholders, motivation and challenges

While in the previous chapter stakeholder participation was analysed with regard to their engagement for the initiatives and which functional part they played, this chapter concentrates on an analysis of stakeholder constellations found in the Case Studies, hence answering the question, who the stakeholders in the cases are. Furthermore, the stakeholders' role at the starting point of the initiatives and the stakeholders' motivation to participate in the co-creation processes are analysed. Coming back to the ecosystem model described in chapter 3.4, this chapter, therefore, deals with a perspective on the micro-level of "actors and roles" (see figure 5). The chapter closes with lessons learned and conclusions.

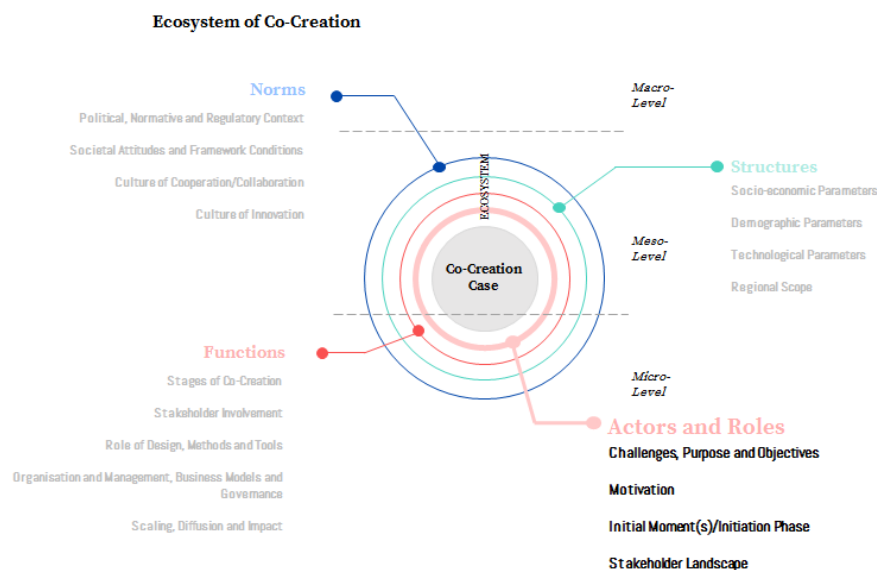


Figure 5 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

Even if it wasn't easy to figure out the exact distribution of partners of the several strands of the quadruple helix (see chapter 3.4) in the single cases, we can say that the participation of three strands dominates, followed by the participation of actors from all strands. The

identification of the problems to be solved by co-creation is done by different constellations of stakeholders. In nearly one quarter of the cases this process is dominated by academia (e.g. scientific studies; see also chapter 4.3). The role of academia differs among the cases. However, we can state two main functions: In some cases, academia is the driving force (e.g. *LTsER Montado*, *Será que o mar vai engolir o Bairro?*, *Engineering Comes Home*), in other cases, they contribute by providing analyses or evaluation (e.g. *Lab of Collaborative Youth (LoCY)*, *Sliperiet / Den Koldioxid snåla Platsen (The Low Carbon Place)*). In numerous other cases, the problem identification takes place at the policy level while in some other the problem identification is done or partly done directly including citizens, designers, consultants, or using existing networks.

### *Motivations to start or engage in co-creation*

We found few information about the starting points of the initiatives from the perspective of the stakeholders. In the case of *ninux.org*, it was a so-called ‘nerd pub’ where the idea of an independent digital network was born. In *Mirrorable*, a couple with a child with a disability was seeking ways to help children with a special kind of disability and created a broad network with partners from academia and the economy. In the *PIKSL* organisation, the target group itself set the starting point as they called for digital devices and training to improve their digital competencies. In numerous other cases, units of government or administration set the starting point. For example, in *Sciencewise – Involve and UK Government BEIS*, a committee of the British House of Lords called for initiatives to foster citizen’s participation concerning scientific projects in order to win back trust for academia after happenings like the BSE-crisis. Several studies revealed that the trust of the British public in policy and academia decreased significantly. By taking people's views into consideration and involving them in decision processes, this trend was tried to be turned around. Overall, these cases show that actors starting the initiatives had very different motivations. Some were starting from a concrete need related to a problem they, their peers, or even their societal domain were facing. Others were motivated by an interest in a certain theme (e.g. technology). Furthermore, these motivations are linked to different levels: some can be understood as specific needs and demands of very specific groups, while others from the examples discussed above were rather linked to larger trends.

Apart from the initial point, also different motivations to participate in the initiatives could be identified for the various stakeholders. Due to the fact that numerous initiatives under examination are funded projects (for the aspect of hurdles due to time restrictions in such

projects, see also chapters 4.3, 5.3 and 6.3), we should define the funding institutions (mostly governments, administrations or the EU Commission) as stakeholders as well. If they are an active partner in the respective case, they might even be internal stakeholders but in most cases, funding bodies are external stakeholders. Their motivation to contribute to the initiatives is to find solutions for important issues on the political agenda – or to show that policy tries to find innovative solutions. However, the motivation of public institutions to start an initiative can be triggered as well by individuals working in these institutions. In the *Ilona - Robot Brings Joy in Elderly Care* Case Study it is reported that the funding by the municipality was pushed by two employees with an occupational background in the care sector. These employees were intrinsically motivated to test the use of robots in elderly care. Similar to that, in the case of *Será que o mar vai engolir o Bairro?*, local facilitators started the initiative to prevent a disadvantaged district ('slum') from being swallowed by a river nearby. In this particular case, hence an altruistic motive seemed to be dominating, which was not explicitly highlighted in other Case Studies.

Besides that, two different kinds of motivation were identified that have a clear economic dimension. In the *Engineering Comes Home* initiative, external stakeholders invited to co-create in the initiative received money for their participation. Similar to that, in the Case Studies about *Innovation Loop Region Västerbotten* and *The BrainHack Project*, the participation in the co-creation activity was exclusively dedicated to the winners of an idea contest. Building new networks and acquiring reputation were motivations for other participants. The Case Study for *ninux.org* exemplifies an approach where participation was linked to a demand perceived by individuals willing to engage. This demand could be described as the will to escape from dependency from commercial internet providers and to offer a network free of profit interests.

As mentioned above, in many cases academia is the driving force for the initiative. The motivation of researchers to engage in co-creation is to gain new knowledge, and they seem to be convinced of co-creation as an adequate and participative approach to reach this aim. Although it was not clearly stated, one can assume that the acquisition of funding is another main motivation for (institutionalized) actors (like scientists) to engage in an initiative. Finally yet importantly, one has to say that of course the will to find a solution for a given problem was the most and strongest motivation for external stakeholders to become internal stakeholders or participants in the co-creation activities. Finally, we can distinguish between political motives, altruistic or idealistic motives, economical reasons, and strategical motivation (reputation, networking) of stakeholders.

### *Roles*

Regarding the roles of the different actors in the cases, we could identify some lessons learned, drivers, and barriers for co-creation processes. A main resource for a successful co-creation partnership is trust (see also chapters 4.3, 5.3 and 6.3 for the role of trust for successful co-creation processes). In this respect, some Case Study authors pointed out that trust between the stakeholders increased by time. It is important that the participating stakeholders are emotionally connected to the project.

A main feature of co-creation in the cases is the participation of actors from different fields of society. Actors in fields like academia and government use a specific jargon. To collaborate successfully in co-creation, participants and even internal stakeholders, like project partners, have to find a “common language” (for the role of communication in co-creation processes and between internal stakeholders, see chapters 4.3 and 6.3). Co-creation often strives for non-hierarchical cooperation. Thus, there has to be an exchange of knowledge and collaboration on eye level. The author of the *Ilona - Robot Brings Joy in Elderly Care* Case Study underlines that one reason for the success of the initiative was that academia was open for advice from actors of other helix strands. The basis for cooperation are common targets and common knowledge, which should be developed during the co-creation process.

Another result is that intermediate organizations like clusters or (business) associations withhold the potential to initiate and to foster quadruple helix collaborations in an ecosystem in order to initiate co-creation processes. A similar potential is observed for municipalities, especially concerning regional projects. Some intermediate organizations have good connections to numerous external stakeholders with the potential of becoming participants. These actors often trust these intermediate organisations and are open to their suggestions. Reminding on the important function of trust, it can be stated that new cooperations have good starting conditions when initiatives can fall back on existing networks. Furthermore, it can be pointed out that if an initiative acts in a regional context, it could be helpful to engage community champions because this could develop a pull effect.

As stated above, a main component of the concept of co-creation is the collaboration of actors from different social fields. Such cross-sectoral or cross-domain collaboration offers opportunities but also harbours risks. Some of the barriers mentioned here, hence are contrary to some of the drivers mentioned above. An important barrier that appears is the

use of “different languages” between the stakeholders. This appeared, for example, between persons with disabilities and other stakeholders. In the Case Study on the *Apulian ICT Living Lab*, it is reported that it was not easy for the participating enterprises to integrate the user perspective in the development process because of different languages. In the case of *Será que o mar vai engolir o Bairro?* less educated and disadvantaged people were not interested in academic questions because they did not see any benefit for themselves in working on solutions for abstract issues. Researchers on the other hand are not interested in collaboration if they do not see the potential to use the results for their scientific work. Clarifying the common targets, using a common language comprehensible for all participants, and acting on eye level are important requirements to avoid struggles and communication issues among stakeholders. Struggle and intrigues could erase co-creation processes. Thus, it is important to prevent such scenarios.

The four-layer model of social innovation ecosystems introduced in chapter 3.4, and used as a major component for the analytical grid of this deliverable, underlines the importance of analysing single stakeholders and their certain backgrounds. Scholars should ask for the motivations and objectives, the capabilities and competences of different actors from different backgrounds. While this was a major target of this chapter, there were limitations especially for the description of complex initiatives with many different actors. Here it was nearly impossible to give detailed information about the background of actors, their motivations, and their individual skills and competencies.

However, the analysis of the Case Studies in this chapter provided some important insights. First of all, it was found that most of the initiatives under examination are funded projects. If the role of actors is discussed, one should pay attention to the influence of funding organizations like governments and bodies of public administration. Their objective to initiate projects to solve certain problems, which dominate the political agenda, sets the pathway for the later initiatives. The degrees of freedom for other actors to influence the themes addressed by the initiative are limited. One core motive for the internal stakeholders leading the project is, of course, to receive funding. In general, political motives, altruistic or idealistic motives, economic reasons, and strategical motivations (reputation, networking) of different actors were identified.

Once a co-creation process has started, it is important that internal and external stakeholders develop common targets and a common language, as it was also discussed in chapter 4.3. For co-creation to benefit from the diversity of participants, their diverse



inputs and perspectives have to be transformed into a common agenda and into a language all participants understand. Finally, yet importantly, trust between participants is the main resource needed for success. Actors who were chosen to coordinate the co-creation processes should keep in mind the different motives for the participation the co-creators. To build trust, these different motivations should be articulated clearly. Afterward, the coordinating actors should support the participants in developing common goals, potential compromises, and a shared terminology for comprehensible communication.

## 5. Comparative Analysis of Co-Creation Innovation Biographies

Out of the 40 Case Studies, 15 have been developed as Co-Creation Biographies, envisaged to deepen SISCODE's understanding of innovation processes, developmental trajectories and stakeholder interactions at the micro-level of the single co-creation initiatives. It is important to note that Biographies are not stories of the organization conducting the innovation, but rather of the innovation process itself that occurs in a specific setting of interaction. Co-creation Biographies are basically an in-depth biographic-interpretative methodology for analysing narratives of participants' experiences in relation to the larger context of a co-creation process. Content and quality of the Innovation Biographies presented in D2.2 Case Studies and Innovation Biographies Report differ to a certain extent. Sometimes, authors did not explicate aspects of a co-creation case for all layers of the ecosystem model (norms, structures, functions, actors). Therefore, the comparative analysis leaves some minor blind spots for some of the categories that have been examined. Overall, the comparative analysis of the Co-Creation Innovation Biographies gives a valuable insight into the development of single co-creation processes. The following table 3 presents the collection of Innovation Biographies of which the comparative analysis of this chapter is based upon:

Table 3 Overview of the selected Innovation Biographies

Case Study	Innovation Biography of Co-Creation Process
<b>ninux.org</b> <i>Italy</i>	<b>Co-Creation Process ninux.org</b>
<b>NESTA - Everyone Makes Innovation Policy - 10:10's Heat</b> <b>Seekers' Quest</b> <i>London / UK</i>	<b>NESTA &amp; 10:10</b>
<b>Engineering Comes Home</b> <i>London / UK</i>	<b>Engineering Comes Home</b>
<b>inDemand</b> <i>Murcia Region / Spain</i> <i>Paris Region / France</i> <i>Oulu Region / Finland</i>	<b>inDemand – Demand Driven eHealth Co-Creation</b>
<b>Smart Kalasatama Well-being Centre</b> <i>Helsinki / Finland</i>	<b>Smart Kalasatama: Health &amp; Well-being Centre</b>
<b>Ilona - Robot Brings Joy in Elderly Care</b> <i>Lahti / Finland</i>	<b>Ilona – Robot Brings Joy in Elderly Care</b>
<b>Apulian ICT Living Lab</b>	<b>Apulian ICT Living Lab</b>

<i>Apulia Region / Italy</i>	
<b>Science Frugale</b> <i>Paris / France</i>	<b>Science Frugale</b>
<b>Making Sense H2020 Project</b> <i>Amsterdam / Netherlands Barcelona / Spain</i> <i>Prishtina / Kosovo</i>	<b>Smart Citizen (Making Sense)</b>
<b>Lab of Collaborative Youth (LoCY)</b> <i>Porto / Portugal</i>	<b>Enhancing Sustainable Youth Citizneship: LoCY's Examples</b>
<b>LTsER Montado</b> <i>Portugal</i>	<b>LTsER Montado</b>
<b>PIKSL - Person-Centred Interaction and Communication for More Self-Determination in Life</b> <i>Germany</i>	<b>Developing a Table for PIKSL Laboratories</b>
<b>Sharing City Umeå</b> <i>Umeå / Sweden</i>	<b>Sharing City Umeå - Framtidens Mobilitet (Mobility of the Future)</b>
<b>Sliperiet / Den Koldioxidsnåla Platsen (The Low Carbon Place)</b> <i>Umeå / Sweden</i>	<b>Den Koldioxidsnåla Platsen - The Sustainable Restaurant Network</b>
<b>Sliperiet / Den Koldioxidsnåla Platsen (The Low Carbon Place)</b> <i>Umeå / Sweden</i>	<b>Den Koldioxidsnåla Platsen - Klimatvisualisering Innovationsprint</b>

### 5.1. Comparing the role of normative, political and regulative contexts

This section covers aspects of the normative and regulatory contexts in which co-creation takes place and their influence on the process. We look at economic, political, and societal norms and values (imperatives) towards cooperation, transparency, and co-creation when mentioned as specifically relevant in the Biographies. This includes a closer look at structural features of the co-creation's ecosystem, institutionalised behaviour of actors below the legislative level as an expression of specific cultures of communication, living, working, innovating, etc. Finally, we try to grasp the "Spirit of cooperation" in each case.

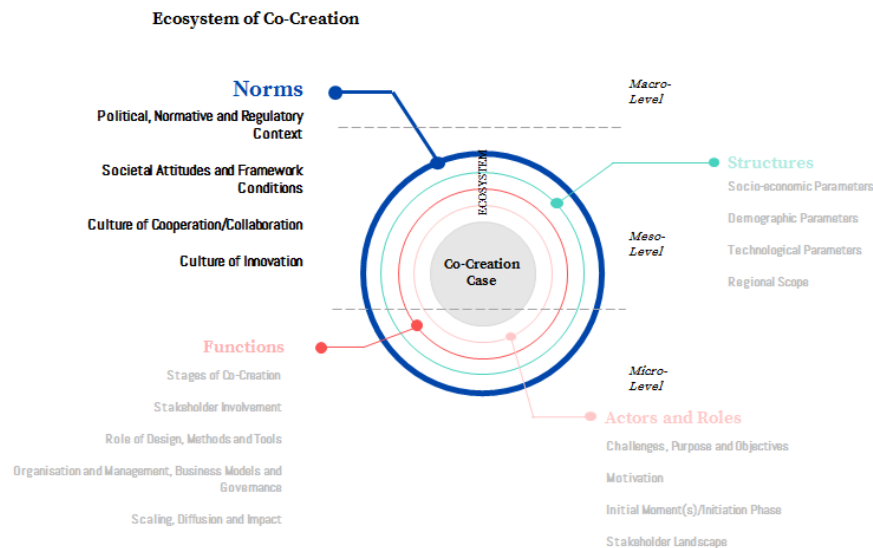


Figure 6 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

## ***Political landscape and regulatory frameworks***

### *Normative and regulatory contexts*

For the London-based Innovation Biography initiated by *NESTA*, the inclusion in innovation policies plays a major role in the normative context. *NESTA* found that there was no comprehensive approach to the integration of inclusion into innovation policy, although researchers and policymakers were beginning to consider the role of innovation in inclusive growth. They also identified there were tensions between ideas of integration and general innovation policy thinking. The research that *NESTA* conducted was in order to make suggestions about what inclusive innovation policies could look like and what could help this along. Therefore, *NESTA* developed the 'Everyone Makes Innovation Policy' programme. Hence, this programme supported the environmental charity organisation *10:10* on how the policy landscape effects the engagement and inclusion of diverse groups. They also provided the project with legitimacy and authority. As *NESTA* was also responsible for the evaluation of the co-creation process they examined whether the 'heat seekers quests' impacted public opinion towards the local council environmental strategies.

The case *Smart Kalasatama Well-being Centre* is also embedded in political strategies on the European level, national and regional level as well as municipal and district level

strategies for the Kalasatama district of the city of Helsinki. This political context lays the ground for the chosen challenges (e.g. EU smart specialization agenda, cohesion policy, European Regional Development Fund & the European social fund as well as the Finnish national strategy 6AIKA for sustainable development, sustainable economic growth through industrial policy and the “Most Functional City in the World: Helsinki city strategy 2017-2021”). Furthermore, these political strategies are the reason why co-creation had been chosen requiring a participatory approach to the development and testing of solutions including agile methods. At the district level, there are two main districts in Helsinki serving as innovation platforms and running agile piloting programs: *Smart Kalasatama* and Jätkäsaari. This not only includes smart city specialisation but also other topics such as health services and circular economy. On the project level, the *Smart Kalasatama* Living Lab facilitates the collaboration of the local large projects and local stakeholders on an ongoing basis, in collaboration with start-ups, corporations, public services, universities, and citizens. Overall, there is strong support by the municipality. Similarly, in the case of *Ilona - Robot Brings Joy in Elderly Care* in Finland the city of Lahti has provided for the conditions in which the co-creation took place. Lahti municipality had already shown interest in new technologies by implementing other innovations in the past, so it could be considered a pioneer and ahead of time in the field. Furthermore, social and healthcare services traditionally are in the responsibility of the local municipalities in Finland, making it a priority topic for the local governments.

The case of *Making Sense H2020 Project* and the *Smart Citizen Kit* is part of a systemic political vision of the FabLab movement, sharing and smart cities that is gaining more and more spaces for building more inclusive, distributed, and sustainable territories. The *Smart Citizen* project also initiated the fight for citizens to give their autonomy back starting with questioning their data. In Barcelona, other initiatives have emerged in parallel for improving the openness of public data, improve the participation of citizens in public policy design, and create a platform for opening innovation. *Open Data Bcn*, *DECIDIM*, *I.Lab* as well as the recent *DECODE* project invite to reflect on data sovereignty in cities. As the city of Barcelona is a smart city leader among many European countries, they support new visions and technologies and early on identified *Fab Lab Bcn* as a key player in the field. The projects directly pinpoint a change of policy about noise pollution at the local level. Within the project, political stakeholders (local politicians, scientific committees) were informed and participated occasionally in the events. The project aimed at creating evidence, and opened up opportunities to establish a dialogue with the City Council and

local residents. Furthermore, *Smart Citizen* is not designed only for local communities but can create new possibilities for researchers to develop methods fed by the crowd (Citizen Science initiatives).

Smart and sustainable urban development as a political strategy on national, regional, and municipal level also lays the ground for the cases in the city of Umeå in northern Sweden. The municipal council adopted a 'Comprehensive Plan for Umeå Municipality' in 2018 to explicate the city's sustainable growth strategies. This includes clear growth targets such as growing to 200,000 inhabitants by 2050 (aiming to almost double the city's population within 50 years). Additionally, this is completed by investments to provide citizens with a healthy environment fostering access to recreational activities and promoting a sustainable lifestyle (e.g. increase in public parks). Furthermore, offering citizens an open, transparent, and democratic process encouraging participation in the planning process, through co-creation and citizen engagement processes is an important pillar in the Comprehensive Plan. Social issues are high on the city's political agenda as well. For example, different measures have been implemented to foster gender equality in the city, from improving gender representation in cultural events to enhancing safety in the streets. In 2014, the Observatory of the European Charter defined Umeå as a 'model town for gender equality'. Furthermore, Umeå municipality has initiated the Call for a European Capital of Social Progress Award to encourage other cities to stand up for a more socially progressive Europe. Based on the sustainability agenda of the city, different politically desired initiatives could be combined in the projects describes in the cases in order to find synergies and to generate more attention. The aim of *Sharing City Umeå* is to envision and test a great variety of sharing services for citizens. Furthermore, *Den Koldioxid snåla Platsen* is also part of Umeå's climate work and aims at lowering climate-sensitive emissions (e.g. by inspiring its residents to switch to sustainable mobility and consumption). The municipality is a great example with regard to sustainable consumption and production (e.g. snow clearance, public transport, library services, school meals, waste collection, etc.). A key insight the team members gained through the project is the importance of social norms for long-term sustainable habits and behaviours and that changing norms is difficult and takes time. Although norms are taking a long time to change, the team is convinced that those people who took part in the project's activities are, in various ways, contributing to this shift in norms through their newly found habits, knowledge, and attitudes. Personal norms and habits change gradually when people take a first step towards something new, which eventually becomes a habit. This is true for both municipal activities and personal choices.

Climate-smart choices often start with a single step that feels easy, but which is often followed by other sustainable steps, such as what people eat, how much they buy, or where to go on holidays. Therefore, with regard to political strategies and instruments, it is relevant to adopt a holistic approach to citizen's sustainable lifestyles.

The political context of the Apulian region in southern Italy is also setting the ground for the *Apulian ICT Living Lab* which is an initiative promoted by the Regional Government, in particular by the Economic Development, Employment, and Innovation Department. It was implemented by *InnovaPuglia*, an in-house company of the Apulia Region's Technical Support Division. During the last 10 years, the Apulia region went through a transformation process, with public administrations proactively embracing activities to support a cultural change, towards the principles of simplification, transparency, involvement, participation, and sharing. For example, in 2017 the regional "Law on Participation" was approved (LR 28/2017), setting a permanent framework for the participation of citizens, local administrators, and cultural, economic, political and scientific actors, based on information, transparency, consultation, and listening, as well as on the right of citizens of verifying and monitoring the commitments taken up by the government. The drafting of the law itself was conducted as a participative exercise, involving thousands of citizens, institutional representatives, and the third sector throughout the whole region. The law recognizes participation as a right and duty of Apulian citizens, identifying forms and instruments of democratic participation, to ensure the quality of decisional processes on important topics and on strategic works. One of these instruments is the "Annual Participation Programme", identifying which processes and procedures shall be opened to participation, and with which instruments and terms.

For *Science Frugale*, some aspects within the political context of the innovation system of Paris have been favourable to the success of the exhibition. First, the location of the exhibition can be considered as a political place itself as it concretises the common ambition of several universities of Paris to promote scientific culture in more creative and open spaces. Furthermore, one of the involved universities is dedicated to new means to make science and culture accessible to their students and beyond. By systematizing the integration of their activities in a common depository for open-source contents - (explore-psl.eu).

The Portuguese case *Lab of Collaborative Youth (LoCY)* is concerned with youth policies and participation at the municipal level in the city of Porto, Portugal. The state of the art of

youth and contemporary challenges in youth participation were stated by the local authorities in the Porto's Municipal Youth Plan (a draft co-produced with the support of a local university and federations of youth and students' associations). It was discussed at the Municipal Youth Council in 2017, but never officially published. The identified challenges for youth citizenship are usually tackled through a wide offer of public events and initiatives targeting youngsters and were organised by the youth and academic NGOs and associations, informal groups, and occasionally by the policymakers. The latter initiatives were mostly targeting youth either to 'educate the citizen-in-making' or to inform and consult the target audiences. The former initiatives and events were developed by the application of the 'non-formal education methodology', and were highly participatory, educational and engaging, with an aim to encourage youngsters to take both role of a citizen and a learner in the process of lifelong learning. Nevertheless, in most of the cases, the initiatives promoted the 'consumption' (i.e. use) rather than co-creation with and by youngsters.

The case of *PIKSL* Labs (Person-Centred Interaction and Communication for More Self-Determination in Life) in Germany focuses on the inclusion of people with learning difficulties. The promotion of an inclusive society has been a declared goal in Germany, not only since the ratification of the "The United Nations Convention on the Rights of Persons with Disabilities (CRPD)" in 2009. Inclusion means that it is no longer the disabled person who has to adapt in order to be able to participate, but the focus is on the impeded environment. The unrestricted and self-evident right to participate also means ensuring equal access to information and communication, including information and communication technologies and systems. Digital participation is thus an important condition for social participation as well as for inclusion. Despite the ongoing digitisation process and the explicit statutory provision in Germany that all people should have free and open digital access, as also demanded by the CRPD, several million people are not part of the digital society. This particularly concerns people with learning difficulties.

Working towards an alternative Internet regime is the focus of the case of *ninux.org* in Italy. In this respect, a crucial issue concerns the political framework that sustains co-creation processes, and that pollinates the co-creation of the network, relying on the larger social movement for alternatives approaches to the existing Internet regime. Analytically speaking, *ninux.org* represents a peculiar digital resource, distinctively characterized by the need to materially build and maintain a technical infrastructure, thanks to the creative adaptation and co-creation of technologies by activists and concerned groups of citizens. In



this sense, it should be highlighted that *ninux.org* embodies alternative economic and cultural visions. They are oriented towards a non-profit economic paradigm, demarcating an alternative to the for-profit and centralized models adopted by commercial internet service providers (ISPs), on which the internet is today largely organized. Furthermore, this socio-economic approach, rooted in a non-profit logic of action, is also supported by alternative cultural and political discourses about the use of the internet and the active role citizens should achieve in the digital society. Indeed, *ninux.org* community present itself as a specific common resource, which may enact and support civic engagement to strengthen a more sustainably access digital networks, more respectful of users' rights. Indeed, both the motivations that help to mobilize the participants and the decisions about technical details in the adoption of a certain type of technology for the co-creation of the network are heavily influenced by a set of political ideologies shared by participants (e.g. use or not use exclusively materials released under an open license).

These political ideologies not only represent a relevant motivating framework for the enrolment of new participants into the project, but they also can play a central role in shaping the decision-making procedures and the resulting specific technical solutions to be adapted to the infrastructure. In this sense, political motifs can be the driver of disagreements and conflicts concerning how the infrastructure should be developed at large. Discourses over co-creation in *ninux.org* stress the idea that the conventional model of the «consumer» needs to be replaced with the figure of an «engaged user», who should participate actively in some of the activities required to make the network work. This alternative political vision of the ownership and the role of users come together with an explicit criticism about the lack of privacy and the increasing surveillance and tracking efforts over the internet. Concerning the nature of relationships enabled by the co-creation of *ninux.org*, it is worth noting that local islands developed a strong relationship with left-oriented 'squatted social centers', which in the last two decades played an important role in developing critical discourse about the role of technologies and digital innovation within our globalized societies.

### ***Political influence***

Besides the political and regulatory frameworks that contextualise co-creation processes, there is also influence by different political stakeholders that might enable or hinder certain developments in co-creation. Political influence has been examined for:

- Access to funds on all political levels

- Legitimacy through political stakeholders, such as local politicians, scientific committees.
- Promotion of political strategies/agendas/projects
- Expectation for problem solutions, e.g. new technological developments as a result of co-creation

On the other hand, there are also cases where core stakeholders of the co-creation process are having an influence on political stakeholders as local politicians and scientific committees. For example, this is the case with *ninux.org* where some members of the community are engaged in lobbying activities, both at the national and European level, aimed at renewing the regulatory framework about digital telecommunication in a way to support and encourage the constitution of broadband symmetrical digital telecommunication services in cooperation with non-profit and cooperative Internet Service Providers. Furthermore, in the case of *NESTA & 10:10*, the projects influenced the local strategy of increasing the local areas' heat networks. Similarly, in the case of *Engineering Comes Home* the Borough Council of Southwark learned from the project and now pursues an Empowering Communities programme.

### ***Culture of cooperation***

Generally, in the examined cases conflicts were of low intensity. In many cases, the reason for this is that the 'stakes' in the co-creation were not of high political relevance or related to a change in (e.g. major financial) resource distribution. Therefore, if conflicts arose during the process they could be dealt with through facilitation and mediation. In terms of cooperation, several Biographies described drivers and barriers for collaboration and how it had been handled.

In the case of *ninux.org*, the Linux Day network represents a crucial partnership as an annual initiative where the *ninux.org* community usually organizes activities to promote its projects. Furthermore, as community participation has grown in the network it was decided to develop "internal governance tools", and especially the so-called "Ninux.org manifesto", in which the community mission, strategic goals, as well as a set of common principles and visions in supporting cooperation and conflict management, have been summarized.

For the rather bottom-up initiative of the *LTsER Montado platform*, it is a basic assumption that there is an involvement of the research community, regional population, key stakeholders, decision-makers and all potential beneficiaries of the knowledge produced to construct a Community of Practice that will work together on societal and environmental issues. However, since the platform is not a legal entity with financial and human resources for the facilitation of cooperation, it is more difficult to establish a permanent community.

In the case of *Den Koldioxid snåla Platsen - The Sustainable Restaurant Network*, cooperation between restaurants and the project team of the municipality works quite well. This is because the municipality takes the role of network facilitation for cooperation which is the main driver. Furthermore, the municipality actively supports sharing the knowledge and awareness that has been created by the restaurants in the network, while also shining a light on their good work and presenting some of their 'sustainable dishes'. The restaurants have benefited from the work of the sustainability assessment and coach, including the development of action plans in order to support them on their sustainability journeys. As a side effect, organisations that engage in the restaurant network are now more eager to exchange knowledge with their peers in other restaurants.

For the case *Ilona - Robot Brings Joy in Elderly Care*, the process was planned by the Lahti municipality in collaboration with the Lahti Living Lab. The openness and the transparency of the Finnish society were a big advantage in the implementation of the robot as an innovative solution. All actors collaborated positively and even when some issues or criticism were raised, they were discussed openly. Some of the caregivers who were sceptical in the beginning of the process changed their minds and were positively affected by the positive reactions of the elderly patients to the robot. The experiment and the change it brought were welcomed, certainly because it responded to an implicit but mature need that found an adequate response.

Similarly, for the *Apulian ICT Living Lab*, the positive reception was also the result of a good work of community and capacity building. In particular, training was provided to technical and local administrators about the use of the platform, as well as about specific concepts, in order to coherently refer to territorial needs and to communitarian priorities and language (e.g. the flagships of the Europe 2020 Strategy). In terms of cooperation spirit, the whole process was initially born to address enterprises and SMEs' competitiveness issues. During the process, enterprises' competitiveness, as well as research institutions'

interests, progressively shifted and were measured against their capacity to address territorial effective and real needs; finally, target needs became those of public administrations and of the wider society. A barrier was mentioned where public officials paused the cooperation process for several reasons (e.g. change of political administration, difficulty in placing certain activities with the right cost item from the accounting point of view, in the economic procedures and budget). To summarize cultural aspects of co-creation, an explicit governance vision and political willingness (at the regional level) on the one hand, and the openness and trust of local politicians on the other hand, undoubtedly represented an important success factor for the initiative, in synergic combination with other enabling conditions. The Living Labs approach took off within a stakeholder ecosystem (more about (primary) ecosystems in 4.2) that was not used to such cooperative approaches; nonetheless, all stakeholders, including politicians, showed openness to experiment, as well as readiness to challenge previous habits, understanding that there was a bigger challenge at stake (addressing the difficulties connected to the economic crisis; finding a solution to community urgent needs and demands; strengthen innovation in the regional ICT enterprise system and consolidate its international competitiveness).

### ***Culture of innovation***

The political and regulatory frameworks are closely connected with innovation policies and culture of innovation on the organisational level in the respective context. We distinguish three categories of innovation systems and culture for the examined Biographies. These categories comprise innovation actors (e.g. funders, initiators) and actions (e.g. policies, funding schemes), on all political levels (EU, national, regional, municipal):

- Co-creation in a mature innovation system and culture
- Co-creation in an emerging innovation system and culture
- Co-creation in an early-stage innovation system and culture

For reasons of simplification, at this point, we do not differentiate further between innovation systems and innovation culture as well as between innovation policies on different policy levels. Rather, we try to grasp the notion ‘innovation’ in each Biography.

### *Co-creation in a mature innovation system and culture*

The *inDemand* project has tested a new co-creation model with H2020 funding, which will be later economically supported with yearly available European Regional Development Funds (ERDF). The funding model applied follows both the requirements of H2020 as well as of ERDF, as the Funder organisations within *inDemand* are Research and Development Agencies (RDAs) and other types of entities managing ERDF at the local level. The model is quite a disruptive proposal for the public healthcare traditional way to approach innovation procurement with an effect on healthcare organization management, e.g. by building an organisational innovation culture. *inDemand* recommends fostering the adoption of new instruments in the organisations managing EU funding thereby improving the efficiency in the utilization of those regional funds (ERDF) earmarked for healthcare and/or digitalisation with the aim to foster innovation within regions while combining them with other funding such as H2020.

The project *Sharing City Umeå* is funded within the Swedish national programme ‘Sharing Cities Sweden’. The programme ‘Sharing Cities Sweden’, in turn, is part of a long-term national innovation initiative called Viable Cities (runs from 2017 to 2030). Viable Cities is a strategic program that wants to facilitate the innovation capability of Swedish cities. It has been developed and is funded by several public funding and research institutions, including the Swedish Energy Agency, Vinnova and Formas as well as the KTH Royal Institute of Technology. The programme enhances sharing economy projects and initiatives by developing world-leading test beds for the sharing of products and services. It supports Sweden’s strength in innovation, research and entrepreneurship. Viable Cities is a member organisation platform that is free to join. It brings together some 70 actors from several different fields of research, industry, public activities and civil society following a quadruple helix approach (Carayannis & Campbell 2009).

Similarly, the case of *Smart Kalasatama Well-being Centre* is embedded in innovation policies, funding schemes, and strategies on EU, national and local level which all have contributed to the thematic areas of the *Smart Kalasatama Well-being Centre* district and in the implementation of the agile piloting approach. The strategy of the city of Helsinki, in which the *Smart Kalasatama Well-being Centre* district is located (“The most functional city in the world”), has contributed to the definition of the thematic areas of *Smart Kalasatama Well-being Centre*. The agile piloting approach was designed to help bottom-up initiatives

from smaller players to create innovative solutions across the different thematic domains. Therefore, the project increases innovation capacities of start-ups and residents in the field and providing support in catalysing these to innovation activities by providing not only financial support but also the Living Lab approach of bringing the multiple stakeholders together in co-creation.

Even though *NESTA & 10:10* approached a rather new topic of inclusive innovation, NESTA is a long-standing actor in the UK Innovation System. NESTA supported the development of the project. For example, they conducted a study about “How Inclusive is Innovation Policy? Insights from an International Comparison.” to examine innovation policy statements across ten countries and analysed their overall objectives, the direction of innovation, participation in innovation, and governance of innovation. Their main findings suggest that whilst governments are starting to think more strategically about the range of impacts innovation has on different groups of society, they do not yet have a clear idea on how to implement an inclusive innovation policy agenda effectively. At the time, UK Research and Innovation (UKRI) had recently been developed which shifted how the UK’s innovation policy is designed and delivered. UKRI has a mandate to support social and cultural impact to support society to become ‘enriched, healthier, more resilient, and sustainable’. Since the Everyone Makes Innovation Policy programme, the Inclusive Innovation team at NESTA has worked more widely on diversity in innovation start-ups and social enterprises. A report ‘Innovation Population’ has been produced which looked at public perception towards attitudes to innovation and innovators. One of the previous project leaders for inclusive innovation at NESTA has since become head of public engagement at UKRI and now influences discussions on more inclusive innovation policies.

#### *Co-creation in an emerging innovation system and culture*

Several of the Biographies describe co-creation processes that have been started under preconditions of a rather emerging innovation system and culture which means that support structures for innovation actors and actions are not yet distinctive.

In the case of *Ilona - Robot Brings Joy in Elderly Care*, the implementation was not related to any political programme, but the two people initiating the process had general support of the municipality and in particular from their supervisors. Therefore, it was a combination of personal motivation and trust and support from the system in the personal motivation of two people who really wanted to bring innovation into the system. Furthermore, one of the

two people initiating the process had a background in nursing which was an advantage, as it provided a direct knowledge of the needs and challenges in the care services at a practical level. Furthermore, it is the result of the strong willingness of the public administration of Lahti municipality, to adopt new technologies for elderly care and provide new services to elderly patients, to better face the challenge of ageing population in Finnish society. Indeed, the Lahti municipality was the first organization in Finland to promote the use of a robot in the public elderly care services.

For the *Apulian ICT Living Lab*, the intuition about the value of Living Labs and co-creation methods is directly linked to the capacity of the Economic Development, Employment and Innovation Department of the Apulian Region of being involved into several EU-level initiatives. The Living Lab methodology was eventually applied and combined with specific regional needs, with an intentional discontinuity with past socio-economic regional dynamics. The objective of this discontinuity and co-creative experimentation was primarily to trigger and support territorial-relevant innovation processes and the industrial and productive fabric, to unleash effective economic development at the regional level, especially of SMEs. The context of historical and cultural complexities in the Apulian region in Southern Italy is known to be rather hindering the take off and spreading of innovation dynamics. Though, the *Apulian ICT Living Lab*, initiative seemed to have bypassed all such contextual limits. Moreover, the process has undertaken some steps towards the phases of sustaining and scaling which accounts for the profound relevance of the action in its territory. An explicit governance vision and political willingness (at the regional level) on the one hand, and the openness and trust of local politicians, undoubtedly represented an important success factor for the initiative, in synergic combination with other enabling conditions.

The *Smart Citizen Kit* went through different innovation systems, starting locally at FabLab Barcelona (crowdfunding initiative) with further support by the Waag society and Amsterdam city policymakers as well as PhD funding from Intel and UCL. In an effort for improving technological parts and testing participatory sensing approaches the project partners applied to the EU H2020 Call ICT2015 Research and Innovation, specifically under the CAPS “Collective Awareness Platforms for Sustainability and Social Innovation. The project proposal *Making Sense* was successful (grant number 688620). *Making Sense* has been a really important opportunity to validate the *Smart Citizen Kit* 1.5 with real users during the Barcelona Pilots prior to move to the final industrialization and commercial

exploitation of the platform. Furthermore, *Smart Citizen* can be applied by researchers in a Citizen Science Approach.

Similarly, the *Science Frugale* exhibition is innovative not only because of its global approach – the way of opening the process and co-create knowledge with a cultural place – its methods, tools, and postures but also in the topics and projects shown who are aligned with emergent practices of social innovation and citizen sciences in the context of science centres. The exhibition took place in an innovative Science hosted by Paris research institutions to create scientific mediation and to foster collaboration between academics and a wider audience.

#### *Co-creation in an early-stage innovation system and culture*

Some of the Biographies' cases can be characterised as early-stage innovation systems and cultures where innovation actors and actions are not yet in place.

For example, in the case of *Engineering Comes Home*, the field of infrastructure engineering is not often associated with co-design, making the case quite innovative because it introduced engineers to this concept.

Similarly, in the case of *Lab of Collaborative Youth (LoCY)*, prior to the co-creation process, the schools as well as local administrations did not recognise and support co-creation as a valuable approach. Finally, the process of including the Municipal Youth Council in the development of the Municipal Youth Plan 3.0 has provided some feedback on LoCY's ongoing actions and validated its purpose and way of conducting its activities. It also recognised LoCY as a good practice and included LoCY's action plan to develop additional codesign programmes in various schools of Porto, together with the support of MEDesTU and Municipal Division for Youth of the Municipality of Porto. Municipal/local support was provided through dissemination, participation, and infrastructural support of the LoCY's activities.

This also applies to the case of *PIKSL* where the innovation system for the co-creation process is not well advanced. It merely comprises an innovative environment by the use of design (methods) as well as the (financial) support of the initiators, partners, and networks for co-creation and is characterised by participation, equality, resource orientation, empowerment, as well as open, committed and interdisciplinary employees.



Finally, in the case of *LTsER Montado*, the region Alentejo is classified as a “Moderate Innovator” region with an increase of the regional innovation performance over time (Regional Innovation Scoreboard 2019 2019). The regional administration manages several financing instruments intended to promote regional development, but none is directed towards a support of the *LTsER Montado* platform.

Co-creation practices are sometimes more ambitious towards participation and RRI than the (innovation) political frameworks they are embedded in. On the other hand, many of the Biographies investigated use co-creation approaches because of funding-requirements in the innovation policies and innovation policy instruments used on all political levels (EU, national, regional, and municipal level).

## **5.2. Comparing the role of socio-demographic and economic contexts**

For some cases, the socio-demographic context in which the co-creation takes place is quite relevant for the development of the co-creation practices as well. For example, in the case of *ninux.org*, internet nodes exist foremost within metropolitan areas in Italy such as Rome and Florence where a certain group of citizens are core enablers and supporters of the *ninux.org* network. Members are for example composed by people with an age between 18 and 40 years, with higher education (BA, MA or Ph.D. degree) and strong expertise in science, technology, and engineering. Usually, they also work for high tech companies who are active in the ICT sector or are engineering students.

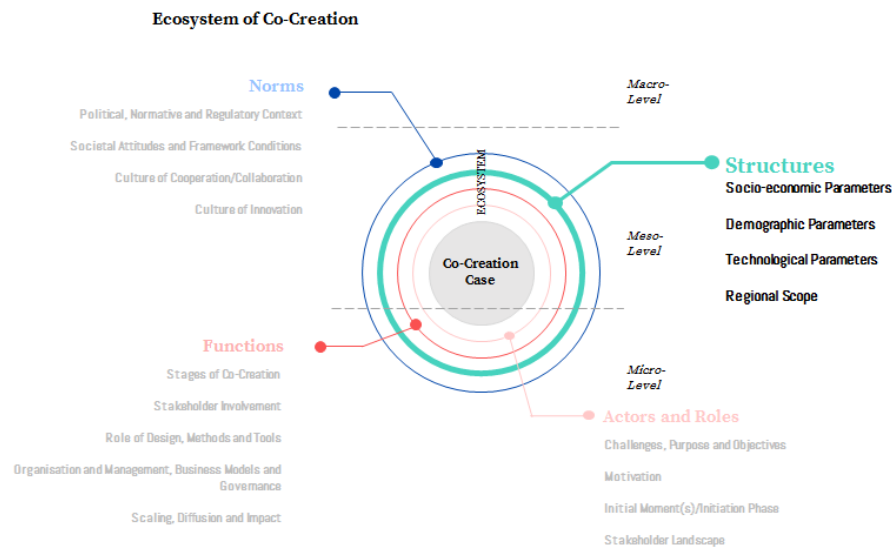


Figure 7 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

The socio-economic and demographic context also plays a role for innovation policy-making and inclusion in the case of *NESTA* and *10:10* charity in the UK. The context of the co-creation case is based on evidence that the **benefits of innovation** do not trickle down to all members of society. In addition, there was recent evidence that children were more likely to become innovators if they had parents with higher incomes. The co-creation case was therefore embedded in a research endeavour in order to make suggestions about what inclusive innovation policies could look like and what could help this along. In that specific case, the problem of inclusive innovation was linked to raising environmental awareness and highlighting new technological solutions. Islington Council, a local authority district in London with powers on local policies and strategies, conducted an energy project which aimed to provide cheaper and greener heating solutions to over 800 homes in different areas of the urban district. The energy centre uses the heat created from producing electricity to create hot water that is piped into people's homes, making it more efficient than a normal power station, for which the heat is ordinarily a waste product. *10:10* initiated the co-creation process to engage citizens with the energy project in an interactive and stimulating way to enhance environmental awareness about decarbonising heating and not waste energies. Another London based co-creation process took place in the London Borough of Southwark in a former council estate that is currently undergoing regeneration and is composed of a mixture of social housing tenants and private tenants. This means that

there is a great income disparity between residents, with those who have recently moved into the estate having a significantly higher income than longstanding residents. The co-creation process was developed to engaging citizens on infrastructure refurbishment within their communities with regard to wellbeing and social inclusion.

Another example of socio-economic and demographic context relevance with regard to inclusive innovation is the case of *PIKSL*, Germany. The organisation *PIKSL* aims to close **the gap in digital participation opportunities** in the context of people with learning disabilities. For example in Germany, several million people are not part of the digital society, partly for those reasons. This particularly concerns people with learning difficulties that due to inadequate access, non-barrier-free offerings, and a lack of inclusive teaching and learning materials are often unable to make full use of the opportunities offered by information and communication technology. Therefore, *PIKSL* labs are public educational places where people can access digital media, acquire digital skills, and gain Internet experience in open settings as well as taking courses to deepen their knowledge.

The demographic context of an **aging society** is the background for the co-creation case of *Ilona - Robot Brings Joy in Elderly Care*. For many European countries, it will become even more difficult to provide sustainable care with an ageing population and a shrinking workforce in a welfare state system in the future. In the case of societal ageing, this complexity is also caused by diverging stakeholder views. A special concern expressed in the public debate has been how to create sustainable systems to care for the ageing population in a way that achieves a balance between the economic and social requirements for sustainability without overemphasizing economic objectives. This challenge cannot be solved within the boundaries of a single organization or at specific administrative level because of its intrinsic complexity and the multi-actor and multi-sectoral challenges related. *Ilona - Robot Brings Joy in Elderly Care* is one example from the city of Lahti in Finland where technology is expected to play an increasing role in meeting the anticipated sustainability gap in elderly care services. In Finland over 1.1 million people have been older than 65 years in 2015, which is the sixth biggest share among the EU-28 countries.

The socio-economic and demographic context of the Apulian Region in southern Italy played a major role for initiating the *Apulian ICT Living Lab*. The Apulia Region is still classified as belonging to the Convergence objective of the EU Regional policy referencing regions in Europe that are less developed. The Living Lab initiative was initiated by the Economic Development, Employment and Innovation Department of the Apulia Region

with the intention to disrupt path dependencies in current socio-economic regional dynamics. The objective of such ‘discontinuity’ - especially under the forms of co-creative experimentations – was primarily aimed at triggering territorial-relevant innovation processes in order to effectively **unleash economic development** within the regional industrial and productive fabric, and support the specific competitive capacity of enterprises and in particular of SMEs, which are predominant in the regional productive context. Instead of continuing with a ‘technology push vision’ of innovation, the living labs approach followed a more societal needs’ oriented perspective in innovation. The Region saw in the Living Lab approach a way to bring simultaneous benefit to public administration, companies and enterprises from Apulia, and the entire regional civil society. Even if an intricate combination of negative contextual factors still makes it difficult to achieve more stable results, the Living Lab initiative showed that changing the region is possible and that a significant margin of improvement and potential for change in southern Italy’s regional development is possible.

Co-creation processes can also be specifically linked to the interrelation of socio-economic and ecological contexts of a region. In the case of *LTsER Montado* in Portugal, the co-creation process is centred around the **preservation** of Portuguese oak tree forests (so-called ‘montado’). The need to preserve these species has been stressed leading to the introduction of multidisciplinary community practices such as *LTsER Montado*. Given the cultural and also the economic significance of cork oak trees to Portugal, preservation of these species is of equal relevance and importance. Alentejo is the largest Portuguese region with a territorial area of approximately one third of the national territory. Here, the majority of montado is located. The population density is the lowest among the regions in Portugal and over the past decades, the region has undergone an average negative population growth rate largely due to rural exodus (as there are less infrastructures, jobs, and opportunities) and an ageing population. The communities surrounding montado forest areas are aware of the challenges and socio-economic implications.

A socio-demographic and economic context of a growing city is the background of the co-creation processes in the city of Umeå and Region Västerbotten in the northern part of Sweden. Umeå municipality's vision is to become 200,000 inhabitants by 2050 and be a pioneer in the **sharing- and circular economy**. For that reason, Umeå is an active participant in the OECD project ‘The Economics and Governance of Circular Economy in Cities’2’. The municipal council adopted a ‘Comprehensive Plan for Umeå Municipality’ in 2018 which includes five sustainable growth strategies. On the one hand, this

comprehensive plan lays out targets such as the promotion of city growth in a five-kilometre radius from the city centre including easy and effective sustainable mobility options as well as high-density new city districts to support new areas with sustainable services and sharing solutions. On the other hand, the comprehensive plan also indicates participation and citizen engagement as one important pillar in achieving the growth targets (offering citizens an open, transparent and democratic process encouraging participation in the planning process, through co-creation and citizen engagement processes).

### ***Regional Scope***

#### *Neighbourhood/Local*

Co-Creation processes at a local level enable a variety of **citizen engagement possibilities**. For the case of *Engineering Comes Home* the co-creation aimed at including residents and tenants of a specific estate in a district of London which was currently undergoing a regeneration process. In the *10:10* case, citizens were invited to participate in a ‘heat seeking quest’, meaning to walk through their neighbourhood with thermal cameras, recording where waste heat was being lost and how it may be recycled. Similarly, the *Smart Citizen Tool* is tested in local environments and people connect via local FabLabs for building the tool. This way, the *Smart Citizen initiative* is now acknowledged beyond its local context and even plays a role for ‘Barcelona’s Smart City strategy’. The case *Smart Kalasatama Well-being Centre* shows how one urban area in Helsinki - Kalasatama – has been developed into a smart city district for several pilot projects in order to gain proof of concept for rolling out smart city strategies for the whole municipality. One specific technology, the *Ilona service robot*, has been introduced in several elderly care services in the city of Lahti, in Southern Finland. This way, different elderly care institutions can test and further develop the robot to the specific needs of the aging population as well as the local care service providers. The *Lab of Collaborative Youth (LoCY)* case addressed co-creation processes with young people in Porto, Portugal. *LoCY* implemented the co-design programme in local Basic Schools as well as in Artistic and Vocational Schools in different districts of Porto.

#### *Cities and city networks*

Similarly to the local level, co-creation processes at the city level enable a variety of **citizen engagement possibilities** as well. In the case of *ninux.org*, the network nodes are

developed in metropolitan areas such as Bologna, Firenze, Pisa, Roma, Torino, and Verona. These are several **local “islands”** based in different Italian cities. Even though *ninux.org* is a widespread network all over Italy today, it is still deeply rooted in the metropolitan areas of certain cities.

The *PIKSL* Lab case illustrates another way of regional scaling. The first Lab started in Düsseldorf, a city in the state of North Rhine-Westphalia in Germany. The Lab idea has now spread to other cities and additional *PIKSL* Labs e.g. in Bielefeld and Dortmund have been set up. The case of *Science Frugale* took place in Paris. Paris is the most important city in France with regard to cultural and research excellence. For *Science Frugale*, this environment of institutions that combine science and research dissemination with citizen engagement was constitutive for building the co-created exhibition.

The cases of *Sharing City Umeå* and *Den Koldioxidsnåla Platsen* in Umeå refer to co-creation processes that aim to impact the whole city development. By testing and evaluating different ways to promote climate-friendly choices in everyday life, the project developed new tools for the municipality's climate actions. This is done in accordance with a comprehensive city planning process.

### *Region*

The examined cases on the regional level focus more on co-creation among institutional/organisational stakeholders. Although, they also partly include citizen participation. The socio-economic and demographic contexts are often closely linked to the regional scope of a co-creation process. For *inDemand*, co-creation processes in the healthcare sectors in three different regions in Europe have been developed (Murcia Region (Spain), Paris Region (France), Oulu Region (Finland)). In the case of the *Apulian ICT Living Lab* the Regional Government of the Apulia Region in Italy, in particular the Economic Development, Employment and Innovation Department – Industrial Research and Innovation Service have been promoting co-creation processes for the whole region. It was implemented by InnovaPuglia, an in-house company of the Apulia Region. The *LTsER Montado* case co-created multidisciplinary community practices for and with the montado forest communities in the Alentejo region in Portugal.

### 5.3. Comparing Co-Creation on micro -level - the role of stakeholders, methods and cooperation

The following chapter elaborates on the context level “**functions**” of the ecosystem model (see figure 8) and compares co-creation on a micro-level, e.g. stages of co-creation, stakeholder involvement, the role of design, methods and tools, organisation and management, business models and governance as well as scaling, diffusion and impact for the examined 15 Innovation Biographies.

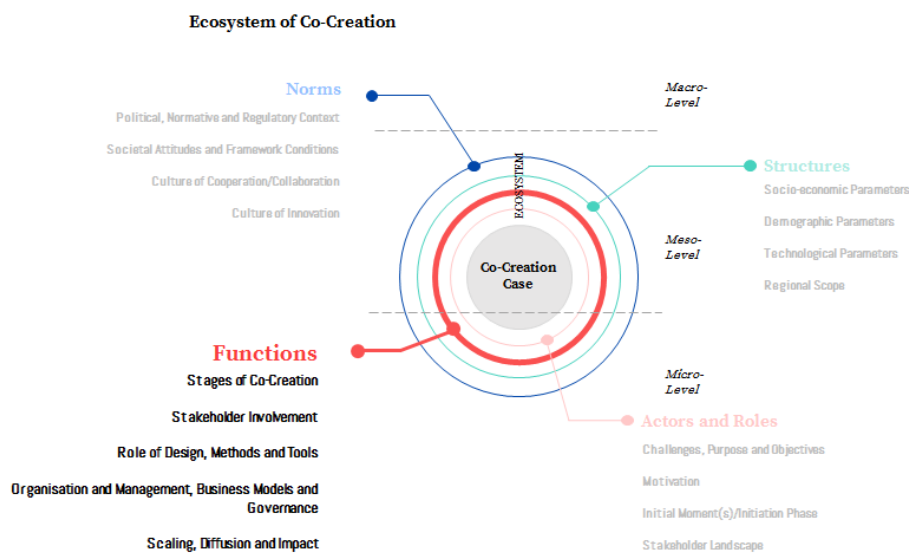


Figure 8 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

#### 5.3.1. Co-creation process

Generally, different approaches have been identified by having a closer look at the realization of co-creation processes referring to the stages of the single co-creation activities here as they have been divided initially. Some projects undergo all stages of co-creation (problem identification, ideation, prototyping, testing), whereas others focus on only one stage. Thereby, the analysis of the Biographies shows that co-creation is a process of two general elements:

- 1) Context analysis, ideation and prototyping,
- 2) Experimenting around co-created products and services.

It can be used at different stages and it offers an open, transparent, and democratic process that encourages participation. Especially the last-mentioned aspect points out that co-creation addresses stakeholders as participants, whereby the co-created products and services lead to changes in their life situation as well as to a change in their way of thinking. Co-creation is thus a process that is a response to challenges, participants face to. Moreover, co-creation is not only a method; it is rather an initiation as the Biography of *PIKSL* showed – because the initiation of the first *PIKSL* Lab is the result of a co-creation process. Besides this, the Biographies also show that there are projects where co-creation is following individual stages or an explicit cycle with all the abovementioned stages of co-creation.

Concerning the aspect of **stakeholder groups** as participants, a co-creation process addresses a broad spectrum of them – municipalities, policymakers, (non-governmental) organisations, academia/researchers/scientists, users/consumers, citizens (of all age and social backgrounds), etc. In short, actors from the quadruple helix (government, academia, industry, civil society) are generally involved to share and elaborate their different perspectives on the topic and/or problem. Moreover, their selection is often based on predefined criteria and done through open calls, newsletters, and social media campaigns as well as on using more direct ways of recruitment like personalized invitations. Also, their selection and involvement can be based on other already involved participants. This means that initially recruited participants identify and finally involve other important ones. As demonstrated, for example, by the project *Engineering Comes Home* and *Den Koldioxid snåla Platsen (The Low Carbon Place)*, stakeholders as participants can act as a gateway or as a role model to others as well as frontrunners for those who are yet to reach the point of co-creation. Hence, stakeholders as participants can initiate the co-creation process, whereby the Biographies showed that the process should start with those who are open to change. Then others will follow later because they are motivated by meeting others who are in similar situations. Moreover, stakeholders as participants are mainly responsible to integrate the users' perspective into the co-creation process. This is successfully shown in the *PIKSL* Biography, where users with learning difficulties gave an insight about their needs in the development of a work table as well as in *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)*, where users' involvement is highlighted as a very effective way to get a better understanding about them and their perspectives.



With regard to the function of stakeholders as participants in the co-creation process, it became clear that from the different projects' perspectives, stakeholders can have a variety of functions for them. This means that stakeholders as participants can play different roles at various levels in the co-creation process. They may act as evaluators, co-creators, experts, or as professionals in selective phases of co-creation or in the full process, right from the beginning. Moreover, they are involved for various reasons and scopes: to discuss their point of view, to ensure the transfer of knowledge, to use their know-how/expertise, to support and provide resources/knowledge or to support and promote co-creation or phases of co-creation. Hereby, various Biographies emphasise on the function of experts because experts, who can be end-users, citizens, people with learning difficulties, policymakers, etc., transfer their experiences, knowledge, know-how, and expertise in co-creation. But some Biographies also point out other functions of stakeholders as participants, e.g. their supportive role to communicate and collaborate. Hence, a strong involvement of different groups of stakeholders as participants is one of the factors of success in a co-creation process because different stakeholders bring various perspectives into the process and push it forward by bringing specific knowledge, resources, experiences, and competences into it.

The Biographies are characterised by the different application of **design and its related methods**, whereby the chosen design and method has an impact on the co-created results. Across all Biographies, especially workshops are a very common method for co-creation. Particularly often seen workshops are participatory workshops at different levels (local, regional) to open the participation to a wider public as well as workshops designed as roundtable talks, design-thinking, discussions, or world cafés to exchange experiences. Besides these workshops, there are also other relevant methods for co-creation, like interviews and surveys to gain knowledge prior to starting the co-creation process, action-research to gain practical knowledge, Living-Labs to bring simultaneous benefit to different participants, gaming to involve actors, etc. Moreover, in the co-creation Biographies are often seen user-centred approaches and holistic perspectives instead of focusing on just one area of the process (see also chap. 4.3.1). On top of this, user-centred approaches were outlined as highly successful in bringing users' perspectives into the process and in creating a good understanding of their needs. Especially in these approaches, it became clear that the use of visualisations can be as helpful as the use of simple language to give guidance to participate in the process or to co-create. Therefore, the co-creation process gets forward with well-chosen methods and designs, whereby the use of different methods helps to

maintain the users' perspective throughout the process. Besides the abovementioned methods and designs, there are also tools used to involve the community, regional population, decision-makers as well as potential beneficiaries of the knowledge produced. Some examples are tools to support collective works, tools for having a say, without necessarily saying it out loud, tools to open up co-creation (pilot schedule), tools to welcome participants in the co-creation process (onboarding kit), communication tools (Telegram) as well as community-building tools to bring people together (onboarding kit). Especially the last-mentioned tools – community-building tools – have a most notably role because they welcome actors in the co-creation process and bring them together for a growing community. Thereby, emails appeared as entry points to the community to provide information to interested people and actors in a more mediated way. Moreover, one Biography (*Den Koldioxid snåla Platsen - Klimatvisualisering Innovationsprint*) suggests that it might be useful to try not to use the usual communication (tools) of public authorities, but rather others to establish a sense of community for a problem. Another point *ninux.org* mentioned is that Websites do not seem to be particularly effective as a tool for attracting the attention and interest of stakeholders. Hence other tools are proposed like the already mentioned community-building tools. But generally, the use of diverse tools can be a key point for the co-creation process, especially in points of cooperation, collaboration, and communication.

Coming back to the co-creation process divided by **stages of co-creation** as detailed in a previous chapter: problem identification, ideation, prototyping, and testing. Concerning the first stage of **problem identification**, the initial idea to focus on a specific problem or challenge is coming from different sources, e.g. top-down, bottom-up, from participative observations/studies, etc. The problem and challenge, Biographies focus on, is also very diverse. Some Biographies look at challenges associated with digital technologies and the lack of experiences, whereas others look at sustainability goals to make sustainable mobility easy and effective (see *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)*) as well as to lower climate-sensitive emissions (*Den Koldioxid snåla Platsen - Klimatvisualisering Innovationsprint*). Besides these two examples, there are also other (societal) challenges and issues like education and training, ageing population, economic crises, health, inclusion, etc. Thus, co-creation is a response to various societal challenges, whereby the stage of problem identification can integrate different participants in order to gain better knowledge about the problem. After this stage, ideally, a phase of **ideation** follows the clear identification of the problem. Not all Biographies include a clearly

distinguished stage of ideation since this can merge and blur with stages before and after. In contrast to this, Biographies with a clearly distinguished stage of ideation show that stakeholders as participants are again integrated into this phase. They are involved to generate ideas, whereas workshops are used to discuss those upcoming ideas giving them the possibility to take the lead. Concerning the timeframe of the ideation phase, it came out that it can last months with weekly activities to explore and ideate about a specific problem or challenge. This is the reason why some Biographies focus on the idea of planning new structures, developing new approaches/solutions, or changing habits. Furthermore, Biographies that use collaboration to initiate ideas appear as very fruitful for co-creation.

The stage of **prototyping** is seen explicitly in a variety of Biographies as well. Especially in those, where concrete outputs are developed. So, prototyping is used to develop and test new solutions, e.g. for sharing services (see *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)*) or for people with learning difficulties (see *PIKSL*). Thereby, users are involved to analyse, discuss, and evaluate the use of new solutions. This is the reason why, prototyping can be seen as a form of experimentation, whereby the main goal is to demonstrate a realistic and possible concept so that test subjects can give valuable feedback. On this basis, the **testing** phase identified as a central stage of the co-creation process follows. It generally bases on knowledge to test new solutions, whereby diverse intentions were mentioned in the Biographies. Some examples are the analysis of use, validation, desire of a municipality, experimentation of new solutions in real applications, and the demonstration and presentation of prototyped solutions with a view to make them available and accessible to interested users. Testing also includes acquisition, combination, structuring, and use of existing scientific and technological knowledge and capacities to produce designs of products, processes, or services, either new, modified, or improved. By this, stakeholders as users gain experience which can be transferred to other practice fields or to new solutions/approaches.

Going back to the process of co-creation itself, it is an ongoing procedure that can be based on several iterations between and across different stages. Therefore, the conceptual framework of co-creation can be developed through an iterative cycle to bring practice and theory together as well as to produce visualisation tools. These iterative processes take place over several months and are divided into various steps. The project *Den Koldioxid snåla Platsen - The Sustainable Restaurant Network*, for example, did an iterative co-creation process in four steps: availability of new data, development of methods/tools, and development of a toolbox, collaboration and sharing knowledge. However, iteration is

not clearly seen in every Biography that highlights the non-linear pathways of co-creation in different projects (iteration can be seen, for example, in *Lab of Collaborative Youth (LoCY)* and *inDemand*).

Co-creation takes place in different cities, regions, and countries and there is no limit seen concerning the geographical space. Sometimes the operating entity previously defines the space, whereas in other co-creation processes space is defined by its participants. In contrast to this, there are also some co-creation processes that were set up in Living Labs to bring simultaneous benefits to different stakeholders. Besides this, the analysis of the Biographies showed that many Biographies are based on time-limited projects. Because of this, some projects were struggling to institutionalise the co-creation practices beyond the time-span as well as to start the co-creation process at time. This is the reason why some projects start the co-creation process in the middle of the running project. Furthermore, it also takes a long period of time to plan the co-creation process and to include different steps over a long period of time.

Finally, this chapter ends with the evaluative part of the co-creation processes. Thereby it came out that evaluation is happening at different stages of co-creation – sometimes, it is only punctual (e.g. at the end of the process), and sometimes, it is ongoing. Moreover, with the help of stakeholders' and users' feedback, an overall agreement is developed. They tested prototypes/solutions whereby their feedback can make prototypes/prototyped solutions available and accessible to a wider additional community. Their feedback gives thus a key insight for further development. Especially when their feedback is directly considered in product development what is nicely seen in *PIKSL*. Furthermore, the evaluation finds out if there is a gap between what the project does and what users/stakeholders want. Therefore, workshops with integrated discussions were highlighted to evaluate targets versus results achieved.

To sum up, the concept of stakeholders as participants and their involvement plays a central/important role in the co-creation process – especially with a strong involvement directly from the beginning – because they push the co-creation process forward by bringing knowledge, resources, experiences, and competences into the process. Thus, the strong involvement of a different kind of them is one factor of success. Another success factor is transparency and openness. Furthermore, with the help of various methods, tools, and designs, key stakeholders can be integrated into the co-creation process, whereby a special focus is on community-building tools. But the Biographies show that stakeholders as

participants could have benefited from more support from the organizing entities especially in the starting phase of co-creation. Because then co-creation could have been even more successful than it was already seen in the fifteen analysed Biographies - one successfully co-creation process with the engagement of stakeholders as participants and their support from organizing entities can be seen in the example of *Smart Citizen*.

### 5.3.2. Further development of co-creation processes

A further development of a co-creation process is the establishment, advancement, or stabilisation of networks and partnerships beyond the predefined project frame. Thereby, networks and partnerships that are found in the Biographies are very diverse. This is the reason why some networks and partnerships are formal, whereas others are quite informal. Moreover, especially large networks and partnerships are internationally oriented. But there are also some local, regional, and national networks and partnerships as well as mixed and meso forms. Concerning the composition, networks and partnerships enclose all actors from the quadruple helix. Networks and partnerships have therefore a key function in providing access to stakeholders, in involving them, in integrating expertise from several disciplines, in transferring and exploiting knowledge as well as in permitting new forms of empowerment.

Besides networks and partnerships that develop co-creation processes further, co-creation is also marked by some turning points and complicated issues. In *Ilona - Robot Brings Joy in Elderly Care*, for example, experiences with new technologies lead to turning points because those who were initially sceptical changed their mind after seeing how users interact with new technologies. Thus, the co-creation process develops further alike the one of *PIKSL* and *Den Koldioxid snåla Platsen*. In these projects, turning points lead to adjustments in terms of cooperation (*Den Koldioxid snåla Platsen - The Sustainable Restaurant Network*) and prototyped solutions (*PIKSL*). Turning points can thus be emphasised as positive steps in co-creation to stabilize further developments.

However, there have been identified also some **complications and issues that hinder co-creation**. So, in some projects, there were concepts/topics not familiar to or understood well by all participants. Thereby linguistic obstacles were mentioned as a complicated issue that highlights the importance of simplifying and translating projects' concepts/topics. Furthermore, some Biographies point out that there were challenges about the way the project communicated, e.g. in their public image as well as in the co-creation process itself. Concerning this, it came out that it is challenging to co-create and maintain bidirectional

interactions between some participants. In terms of other complicated issues, some Biographies showed that limited time and resources open up problems to co-create, especially when time and resources in one or more phases of co-creation are missing or not available. Moreover, another conflict is about stakeholders as participants. By involving them in co-creation processes, some projects face the problem of hierarchisation because some have difficulties in cooperating by maintaining their role as a top-down leader. But in most of the Biographies, there are predominantly positive issues about **cooperation** resp. no conflicts mentioned. To establish and maintain cooperation around different facets of a topic, it is important to integrate stakeholders who are interested in it. Moreover, the Biographies highlight that cooperation can benefit from coaches as well as from legal entities. Especially the last-mentioned aspect is seen in *LTsER Montado* that showed the difficulty to establish a permanent cooperation without a legal entity. Moreover, other projects display that fruitful cooperation built on trust and spirit what can be seen as a key to stabilise cooperation. Beyond this, a stable cooperation resolves conflicts and creates solutions together with the possibility for further collaboration.

The impact that co-creation processes already made is supposed to gain or expected to gain in the near future and it is mainly described through **systemic change**. But in some Biographies, it is not made clear, if there was a systemic change triggered. Other Biographies, especially the one about *PIKSL*, only point out tendencies of a systemic change – in their case raising awareness of the need for digital participation for all, in reducing existing prejudices against people with learning disabilities and in changing deficit-oriented perspective on people with disabilities into a resource-oriented and empowering attitude. But there are also some Biographies in which systemic changes are described. For example, in the project *Engineering Comes Home* in which it is something that has always been part of the co-creation process. Moreover, other Biographies show that there are co-created solutions that produce a relevant impact on the short-term or on the medium- and long-term. So, in the long term, there is a wish to further contribute, whereas short-term impacts rather focus on the use of new technologies. Moreover, it came out that solutions that produce a relevant impact on short-term are developed through the involvement and experimentation and that relevant impact on medium/long-term can be established through quadruple helix stakeholder partnerships.

Concerning the further development of the approach and the expansion of the idea in the shape of **scaling**, the Biographies show how the project/co-creation process is replicated/adopted in other contexts. In *Sharing City Umeå – Framtidens Mobilitet*

(*Mobility of the Future*), for example, the idea and initiative around the project are scaled with the result of sub-projects. Besides this, it came out that scaling transfers knowledge to other projects, develops new partnerships, and spreads the projects' concept. Moreover, initiatives are also scaled out to different geographical contexts, to other districts, and to different thematic projects. Thereby, the projects' idea scales up thanks to the chance of co-creation practices. Particularly prominent is the scaling process of *PIKSL* because they spread the *PIKSL* idea after winning a number of awards. Besides this, there was also a business economist who was hired to support the scale-up of the *PIKSL* idea. This is the reason why supporters of one project can be marked as highly important to support the scale up of a projects' idea. Although scaling in co-creation is in mostly all Biographies, there are also some, in which scaling was not possible. But these are exceptional cases so that generally it can be said that successful co-creation processes were scaled-up in most of the projects that were illustrated in the Biographies.

The **follow-up** of the co-creation process is described in the following. Thereby it came out that not all projects follow-up co-creation processes because of lacks in formal structures, resources, and continuity or because of no agreements of follow-up. But projects who follow-up co-creation did it by highly motivated participants and throughout already involved regions. Moreover, follow-up is also described as an ongoing process, whereby the diversification of approaches as well as co-created products can be stated as follow-ups. Thereby, the approaches and the co-created products differ from traditional/previous practices, e.g. when people with learning difficulties are taking the role of experts instead of people from the sector personally not affected by learning difficulties (see *PIKSL*). Another example is the successful establishment of a co-created network that continues work after the end of the process (see *Den Koldioxidsnåla Platsen - The Sustainable Restaurant Network*). But generally, it can be said that different follow-ups of co-creation processes were realised in form of new events, products, and practices.

Recapitulating, communities support the development of and the co-creation process itself. Thereby networks and partnerships are the most fundamental and fragile component to co-create. Especially networks and partnerships with stakeholders who want to support, develop, and implement co-creation establish a strong sense of community. Moreover, fruitful cooperation among stakeholders can lead to the transfer of knowledge, know-how, expertise, and competencies feeding into the co-creation process.

### **5.3.3. Organisation and management**

Most of the Biographies are projects, networks, or programmes that are funded by external actors. This is the reason why most of the Biographies have rather structured governance and management structures. The others have quite loose and informal structures.

Moreover, there are Biographies that were initiated by the political level (top-down), promoted by the municipality to engage actors, as well as Biographies that were originated bottom-up at municipal/local, national, and regional level.

With regard to the resources and budgets of the co-creation process, the Biographies show that there are diverse budgets allocated for co-creation and that it is financed/funded by various programmes. But especially in time-limited, externally funded projects, a lack of (financial) resources is a major reason for a discontinuation of the process – it hinders its development and follow-up as a co-creation process. Moreover, it takes time to support co-creation processes, whereby in some Biographies the lack of time to understand the approach is named. Other important resources as human resources, public and private resources, spaces, tools, knowledge, etc. are on top relevant to co-create. But sometimes it can be seen a lack of these resources, why projects often face obstacles to co-create. A key for successful co-creation are thus resources that support the process, e.g. approaches and tools for sharing knowledge, spaces to build on the physical presence of co-creators or human resources to participate in co-creation processes. Thereby the last-mentioned resource is provided by stakeholder networks, partner organisations as well as by individual persons what is paid by personal or volunteers.

Communication throughout the co-creation processes is crucial to reach out to stakeholders as participants and to build closer relationships with them and among them. Thereby it was emphasised that communication between different participants/users has different means according to their individual habits. Some projects have thus no prescriptive template for communication – they based on co-creation. To that effect, communication is based on openness, transparency as well as on informal and non-verbal communication tools, whereby different communication channels as email, personal meetings, workshops, etc. were used to communicate. But in some Biographies, the need for a professional facilitator to coordinate communication is highlighted when communication does not work well with the means described above. This is quite necessary when linguistic obstacles or complex expert-knowledge needs to be broken down to a level that is easier to understand – especially in communication with end-users what is considered as very important in the co-



creation process. Thus, communication turns out to be a success for co-creation and is therefore highly important for it.

All in all, the initiation of co-creation by municipalities could help the process implementation and engages stakeholders as participants. Thereby strong communicative competences are highlighted as helpful, for user-centred co-creation processes. Moreover, the consideration of time and resources that are needed for the successfully running of co-creation is also mentioned. With regard to the last three chapters (co-creation process, further development of co-creation processes, organisation, and management), it can be said that the Biographies highlight the term “stakeholder” in co-creation processes. Thus, stakeholders as participants can be seen as an important key to co-create, whereby the role of designs, methods, tools, and resources are also not to disregard.

#### 5.4. Comparing the starting point - the role of stakeholders, motivation and challenges

In the following, the layer “**actors and roles**” of the ecosystem model including the challenges, motivation, initial moments and the stakeholder landscape is analysed (see figure 9).

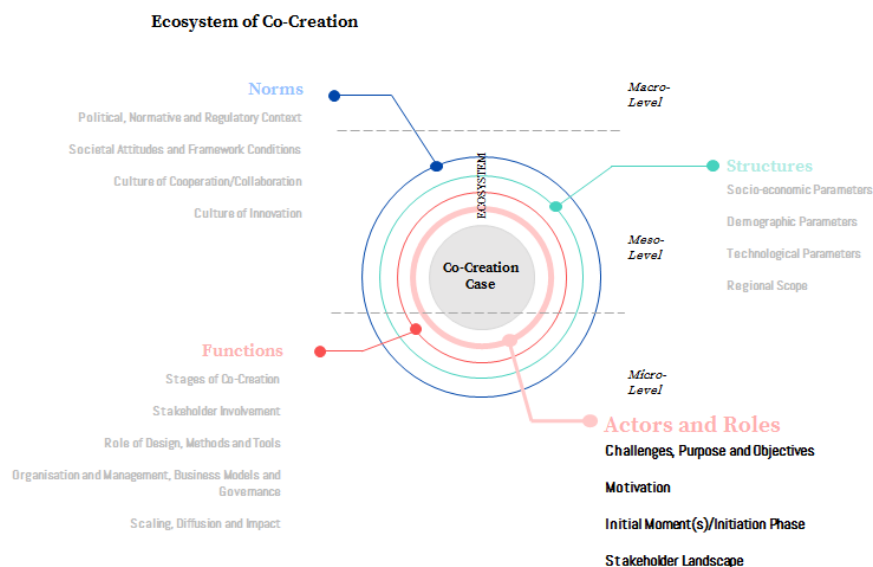


Figure 9 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

### ***Thematic challenges***

The challenges addressed in the various co-creation processes are related to different levels. While some tackle the overall grand societal challenges, others are dealing with more locally defined or organisation-specific challenges. Examining the Biographies, we can differentiate certain policy-field-related challenges which have led to the initiation of the process described in the Biographies in the first place.

#### ***Ecological sustainability challenges***

The societal challenge in the *NESTA & 10:10* case is about Europe in a changing world – inclusive innovation and reflective societies. The specific project by *10:10*, an environmental charity, was on climate action, environment, resource efficiency, and raw materials. For example, *10:10* organised a ‘heat seeking quest’ where the public was invited to walk through urban areas with thermal cameras, recording where waste heat was being lost and how it may be recycled. The other London based case was also about climate action, the environment, and resource efficiency. Specifically, the *Engineering Comes Home* case addressed the topic of water, food, and energy and was chosen by the researchers as they are important issues for London but ones that are not often connected as a whole system. Sewage and water are both pressing issues in London as a growing population and an infrastructure system that was built in Victorian times are beginning to affect how the infrastructure functions, e.g. fatbergs in the sewage system. Climate change is likely to impact on these systems further. As a result, it provided an opportunity to open up discussions about whole-system analysis amongst stakeholder groups.

The case *Smart Citizen* starting in Barcelona is about an open-source sensor kit and visualisation platform that allows citizens to gather and share urban environmental data, such as humidity, temperature, air quality, and noise. *Smart Citizen* is born to open the doors of a new vision, more convivial, and human-centred of the concept of Smart City. Usually, descriptions of the smart city often focus on how technology can help to solve environmental challenges, increase efficiency, and enhance economic growth. This approach can be criticized for being often quite technology-centred with a lack of emphasis on the role of citizens. It has been argued that new forms of citizen engagement are needed because traditional methods for governing the complex interplay of technology, politics, and city management are not sufficient. Some have argued in favour of a more participatory approach that promotes sustainable citizen-led initiatives where the public gains ownership of urban and civic technologies.

Similarly, the cases of *Den Koldioxidsnåla Platsen* (Biographies *Klimatvisualisering Innovationsprint* and *The Sustainable Restaurant Network*) and *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)*, address sustainable city planning as well as decreasing carbon emissions on the level of citizen's consumption practices. As ways of traveling have a significant climate impact, the city must therefore test new solutions for sustainable mobility in new and existing urban areas. As a goal, a sustainable lifestyle including sustainable modes of transport should always be a feasible and easy solution for people living in Umeå. In order to reach that goal, the municipality develops and supports different initiatives around sustainable mobility. Furthermore, with *The Sustainable Restaurant Network*, the issue of sustainable food consumption is raised.

In the case of *LTsER Montado (Long Term socio-Ecological Research)* ecological as well as cultural aspects of socio-ecological systems are addressed in order to promote an improved management of montado forests. The prime objective of *LTsER Montado* is to facilitate the successful development of montado in the long term. Given the cultural and also the economic significance of cork oak trees to Portugal, preservation of these species is of equal relevance and importance.

### *Health care challenges*

The *inDemand* model responds to an explicit challenge as framed by the European Commission through the Horizon 2020 - Research and Innovation Framework Programme. Specifically, it responds to the Programme H2020-EU '*Piloting demand-driven collaborative innovation models in Europe*'. Thereby, the *inDemand* co-creation model focuses on the context of the European eHealth innovation ecosystem.

The case of *Ilona - Robot Brings Joy in Elderly Care* is an example of co-creation focused both on Responsible Research and Innovation and Policy Making, related to the Horizon 2020 *Societal Challenge SC1- Health*, demographic change, and wellbeing. In particular, the *Ilona* implementation focuses on the demographic challenge of an ageing population. To provide sustainable care with an ageing population is a major challenge for many societies. A special concern expressed in the public debate has been how to create sustainable systems to care for the ageing population in a way that achieves a balance between the economic and social requirements for sustainability without overemphasizing economic objectives.

### *Economic and Regional development challenges*

The *Apulian ICT Living Lab* initiative addresses the problem of path dependencies in traditional economic and regional programmes. It has been initiated by the Economic Development, Employment, and Innovation Department of the Apulia Region to make use of new approaches such as Living Labs. The challenge for the Apulian region is to intentionally introduce elements of discontinuity with past socio-economic regional dynamics. The objective of such discontinuity - especially under the forms of co-creative experimentations – was primarily aimed at triggering territorial-relevant innovation processes in order to effectively unleash economic development within the regional industrial and productive fabric, and support the specific competitive capacity of enterprises and in particular of SMEs, which are predominant in the regional productive context. Through the Living Lab approach the Region aimed at facilitating the implementation of the *Regional Development Strategy*, and in particular the part dedicated to Research and Innovation and the regional *Digital Agenda*. The underlying assumption was that Regional development strategies must define new visions of sustainable future for citizens and businesses, as well as increase the quality of life and social cohesion in the territory of reference, through service-oriented communities.

### *Educational and social inclusion challenges*

In the example of *Lab for Collaborative Youth (LoCY)* the focus is on showcasing the necessary conditions to encourage autonomous youth participation, youngsters' self-empowerment, and exercise of power on deciding about matters of concern to living, being and studying in the city. *LoCY* has been addressing the lack of knowledge and comprehension among youth policymakers, school community, and youth associations about Porto's youngsters and the situated conditions for the youngsters' active citizenship. There is a misconception of youngsters' capabilities to initiate, develop, and conduct any type of intergenerational collaborative activity as self-initiative and through coaching. Youngsters are mostly used as an instrument for confirming pre-defined political and formal education agendas in the local context. To fill this gap, *LoCY* focused on sensitising the community towards youngsters' role in the co-construction of daily activities, such as the learning and participatory experiences of being and living in the city.

*PIKSL* aims to close the digital gap in digital participation opportunities in the context of people with learning disabilities. The *PIKSL* Labs are public educational places where people can access digital media, acquire digital skills, and gain Internet experience in open

settings as well as in courses. *PIKLS*'s co-creation processes address various societal challenges, such as the digital exclusion of marginalised groups, the still prevailing protective and deficit-oriented perspective on people with disabilities, and the accompanying stigmatisation of places in disability care.

### *ICT Challenges*

In the case of *ninux.org*, the main challenge is to create decentralised networks that are fully independent from the “mainstream” internet. These kinds of networks are becoming popular as a less-expensive, and sometimes more reliable, alternative to commercial Internet Service Provider connections; as well as a suitable grassroots strategy to cope with the digital divide. Even more, they want to directly deal with privacy policies and data security concerning personal digital data, by assuring a more transparent management and ethical confidentiality of the communications occurring within the *ninux.org* network. The *ninux.org* community represents an emblematic case on how these major societal challenges can be addressed through a bottom-up co-creation approach, as a way to engage lay people and other relevant actors in boosting responsibility.

The co-created exhibition of the case *Science Frugale* wanted to explore how to do low cost experimental scientific research by hacking various available technologies, at the crossroads between experimental scientific research, maker culture, and cooperation with developing countries.

### *Purpose of Co-Creation*

Addressing grand societal challenges is closely linked to the specific purpose of each co-creation process (i.e. why have processes been co-created at all?). For some cases, the focus is more on creating empowering conditions for citizen engagement. For others, co-creation processes the focus is more on creating specific products and services together. Finally, one purpose is often associated with just trying new methods, i.e. testing the way that co-creation works. Often, these goals are overlapping and are of equal importance to the actors involved.

### *Testing innovation methods*

In the case of the *NESTA & 10:10* co-creation Biography, one major purpose was to demonstrate to policymakers the value of engaging the public on innovation issues and to show a range of interesting and exciting ways in which this can be done (e.g. the ‘heat

seeking quest'). The aim was to test creative methods of public engagement on innovation policy in different locations around the UK. The team at *NESTA* funded the projects to analyse how the policy context in which these projects were situated affected them. The other, London-based case *Engineering Comes Home* was a pilot to develop - among other things - resources for future projects employing co-design.

For the *Apulian ICT Living Lab*, one of the most important reasons for applying the Living Lab methodology was to test this new approach for regional development. Through the Living Lab approach the Region aimed at facilitating the implementation of the Regional Development Strategy, and in particular the part dedicated to Research and Innovation and the regional Digital Agenda. The underlying assumption was that Regional development strategies must define new visions of sustainable future for citizens and businesses, as well as increase the quality of life and social cohesion in the territory of reference, through service-oriented communities. The Region saw the Living Lab methodology as a promising way to bring simultaneous benefit to public administration, companies, and enterprises from Apulia, and the entire regional civil society, calling them all to co-design and co-produce.

In the case of *Den Koldioxidståla Platsen - Klimatvisualisering Innovationsprint* one of the main reasons for using co-creation was to test whether service design approaches help to build a user-friendly website. The service-related purpose was to create a platform where citizens can get informed about their climate-effects. In order to make the results and analysis more accessible to citizens, the project team created the website

*Klimatorentering.se*. The website enables people to easily explore the results of a city-based climate calculation and to find out what the climate impact looks like in different districts of the city. The overall aim of the platform is to increase knowledge about the climate impact of consumption habits and that this knowledge should inspire sustainable choices and changes. The purpose of the *Klimatvisualisering Innovationsprint* was to develop and implement the municipal website platform *Klimatorentering.se* in a user-friendly way. The *Innovationsprint* was facilitated by a Service Design Agency.

Similarly, in the case *Sharing City Umeå - Framtidens Mobilitet (Mobility of the Future)*, the Swedish municipality Umeå decided to conduct a 'mobility of the future' user-centred design study for their sustainable city planning. This co-created approach was a new way for the municipality for investigating citizens' mobility habits and further exploring and testing ways in which citizens would change their habits.

### *Citizen Participation and Empowerment*

In the case of *NESTA & 10:10*, the purpose of applying co-creation was not only to demonstrate to policymakers the value of engaging the public on innovation issues and to show a range of interesting and exciting ways this can be done (e.g. the ‘heat seeking quest’). Additionally, the aim was also to approach the issue of decarbonising heat as an issue that people can connect with and not simply a technical or policy problem, but at the same time a valuable, cultural experience. In the case of *Engineering Comes Home*, the purpose was as well to use co-design to trial an engagement method that allowed citizens to actively be involved in decisions in their community. One concrete purpose was also to increase resource efficiency in terms of reduced impact of the community on water, energy, and food resources. Hence, working with community members, the co-design method aimed to identify alternative options for meeting community aspirations, thereby linking resource efficiency and community wellbeing.

In the case of *Lab of Collaborative Youth (LoCY)*, co-creation was used as an integral part of the educational codesign programmes that were developed as extracurricular and curricular initiatives for and with 91 youngsters-participants about youth citizenship. The purpose was to sensitise the community towards youngsters’ role in the co-construction of daily activities such as the learning and participatory experiences of living in the city being a part of its community.

Similarly, for the *PIKSL* case, the purpose of the co-creation was about increasing participation opportunities in the context of people with learning disabilities by creating furniture for the Labs. People with learning disabilities contributed their expertise in breaking down barriers within the co-creation process to the conception and development process of an inclusive, multifunctional, and barrier-free meeting place for the implementation of digital participation. The conception and development process also included the realisation of the corresponding interior, especially the implementation of a height-adjustable work table on castors for mobile use in the *PIKSL* Lab. The designed tables contribute to a de-stigmatisation of the Lab by not associating it with facilities for the disabled, but rather acting as a modern co-working space. Therefore, the purpose of the co-creation goes well beyond creating furniture, but it has been an important aspect of empowering users of the Lab.

The case *Science Frugale* places inclusion and empowerment as one major purpose of its co-created exhibition. The aim of the co-creation process is to value and take advantage of

the full range of competencies of their audiences (i.e. from children to skilled experimental physicists, FabLab members, or professional artists). This mix of backgrounds and competencies of the stakeholders involved is not broken down to barriers artificially defined in terms of visitor “levels”, clearly separating who is the expert and who is the public.

For the *Smart Citizen* case, the purpose of co-creation is equally important on the level of citizen engagement and producing the *Smart Citizen sensor kit (SCK)*. The goal was to move towards more co-created and collaborative interventions in participatory sensing, in which citizens were considered at the core of the whole process. The pilot in Barcelona involved real users in the design, development, and testing of the new version of the *SCK* while gaining knowledge on how open source technologies like this can be appropriated by the communities. Overall, the aim of *Smart Citizen* is to open the doors of a new, more convivial, and human-centred vision of the concept of Smart City.

#### *Co-Creating Products and Services*

For *ninux.org*, the purpose of the network is to develop a co-created, decentralized wireless infrastructure for digital communication that allows interconnecting people (i.e. their computers, notebooks, mobile phones, and other smart devices) by means of wireless antennas, usually installed on the roof of participants’ homes, or on those of informal groups and collective federated with the community. Co-creation practices within the *ninux.org* community describe a bottom-up organisation, being self-organized, decentralized, and emerging as the result of a process of spontaneous engagement where the role of “end-user”, “designer”, or “software developer” substantially overlap. Under this perspective, co-creation processes within *ninux.org* are aimed not only at setting up an operational wireless network by the installation of Wi-Fi antennas on the roofs of members’ buildings, but also in producing and sharing information and actionable knowledge in the field of Information and Communication Technologies.

For *inDemand*, the purpose of the co-creation process is the creation of digital solutions between healthcare organizations and IT companies with higher success rates in terms of market uptake, having been developed together with the client. Co-creating in eHealth enables cooperation between healthcare providers and the emergence of a fast- growing vertical market for tech companies and start-ups. The approach of *inDemand* builds an effective ecosystem approach to healthcare innovation, moving from the demand towards an offer on the market directly engaging final users.



The vision of the *Smart Kalasatama* district is to co-create services in the area that will lead to saving time in the daily life of citizens. Following this common vision, together with stakeholders, the thematic areas for experimentation were created for agile pilots that could explore the different areas of smart and sustainable everyday life. For example, the health & well-being centre in Kalasatama district which provides public health services and social services implemented several pilot projects that were co-developed for new solutions that improve the resident's well-being.

In the case of *Ilona - Robot Brings Joy in Elderly Care*, the purpose of the co-creation was to test the introduction of new technologies in the system of care for the elderly to help facing the challenges related to an ageing population and make elderly care more sustainable. The introduction of new technologies raises important issues and technology-driven and care-driven approaches need to be balanced. For example, the role of clients and users, namely elderly patients and care professionals are considered through participatory activities.

Co-Creating a service platform was also the main purpose of *LTsER Montado*. The co-creation activities focused on studies to identify the most valued services provided by montado, their current and future trends, and the most probable future for this landscape.

Similarly, *Den Koldioxid snåla Platsen - The Sustainable Restaurant Network* co-created a member platform for restaurants around the issues of sustainable food consumption. The purpose of the co-creation processes was to enable restaurants in improving their sustainability performance in order to contribute to citizens' awareness of sustainable food consumption practices. The idea behind the network is that, if the municipality helps restaurants with their sustainability management, customers will get into contact with different aspects of sustainable food consumption.

## ***Roles and motivations***

### ***Motivations***

Co-creation processes are made up of a variety of interactions of different people, each with distinct motivations and interests. Here, we concentrate on the motivations for initiating and for taking part in co-creation processes. Again, motivations, problem identification, and purposes of co-creation are often closely linked. As not all Biographies give a detailed description of motivations of the actors involved we only highlight some examples here. For the purpose of simplification, we differentiate the group of initiators among all

stakeholders, meaning the actors that were involved in starting, funding, and governing the co-creation process. On the other hand, we focus on the group of participants, meaning all stakeholders that have been involved at a later stage in the process.

In the case of *ninux.org*, the group of initiators are also participants of the co-creation network, as *ninux.org* is a bottom-up, self-managed initiative by not-for-profit communities of voluntary people. Motivations for initiating and participating are almost identical. Stakeholders want to overcome the role of the passive user of technologies; they promote a critical use of technological devices that populate our everyday life. The network's initial spirit was mainly targeted at experimentation, ICT tinkering, and the hacker/nerd culture. Indeed, the name of the network, "Ninux", stands for "No Internet, Network Under eXperiment". Even if participants have many different (and sometimes ambivalent) motivations that push their participation in co-creation practices, in general, they agree that all people can build and access a network without paying unfair fees to commercial telecommunications providers.

In the Biography of *NESTA & 10:10*, it must be differentiated between the role of *NESTA* as a funder and facilitator and *10:10* as an environmental charity conducting the co-creation process. *10:10* wanted the public to engage with an energy project in an interactive, fun, and stimulating way to get citizens to begin to talk about decarbonising heat and waste heat. Furthermore, *10:10* wanted to pilot and develop 'heat seekers quests' as a method to engage the public on waste and recycled heat which they could later reuse. They brought in their expertise in public engagement exercises on the issue of climate change. For *NESTA*, research about inclusive innovation actions was the main driver for funding the process.

In the case of *Engineering Comes Home*, the co-creation process was mainly motivated by the initiator – a professor that wanted to develop a project which tested co-design as an engagement method. By doing this, she wanted to develop a standardised procedure to be used when engaging community residents on issues relating to their infrastructure. This was based on her findings showing that community participation from an early stage reduced impacts of refurbishment on their wellbeing and highlighted differences in the effects of any changes for leaseholders and tenants. As the emotional engagement with the solution was important, the research team focused on a group of residents who were already being engaged in issues relating to the infrastructure of their community.

In the case of *Ilona - Robot Brings Joy in Elderly Care*, the municipality was the main driver with a motivation stemming from the need to find solutions for a growing elderly population and an interest in testing new technologies. To increase stakeholders' motivation for participation and to help build emotional connections, Lahti city officials decided to rename the robot (previously called 'Zora') to Ilona (a Finnish female name meaning 'joy'). As Ilona was a top-down initiative, being directly promoted by the municipality, it was easier to engage all the actors and no special incentives were required. The Lahti Living Lab already had prior fruitful collaborations in place with the city, and there was a long-lasting collaboration built on trust and spirit of cooperation. The sites selected for the implementation of the robot were also willing to participate in the activity and involved since the early stages of the planning of the activities. Even though the municipality was the main driver, all actors actively and positively participated in the process, bringing in their expertise and trusting one another along the whole process.

Similarly, in the cases of *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)* and *Den Koldioxid snåla Platsen*, Umeå municipality has been a major proponent in initiating the projects. Furthermore, especially in the Biography of *The Sustainable Restaurant Network* in Umeå, it becomes evident that highly engaged facilitators of co-creation within public administrations can be an important driver for co-creation.

Motivations in the case of *Science Frugale* relate on the one hand to adaptive solutions to the (un)availability of resources of the initiating actors involved. This means that due to changes in university's structures local scientific researchers have to find new ways of practicing research in a context of reduced budget and limited resources. On the other hand, new technological platforms such as FabLabs were integrated into the infrastructure of universities allowing for new and accessible forms of experimentation. Furthermore, there was a strong motivation of actors involved on the side of initiators as well as participants of transferring technologies from the most developed countries to the poorest as well as inviting the North to learn from other cultures and practices.

*Smart Citizen* was initiated by stakeholders at FabLab Barcelona to demonstrate changes in the way citizens are engaged in innovations with a focus on measuring and utilizing data of local environments and community empowerment. The approach consisted of engaging citizens and other stakeholders such as scientists, policymakers, and other representatives related to environmental decision making and action. It is based on four values –

empowerment, co-creation, openness, and change-making. The project is strongly motivated by the environmental and citizen engagement ambitions of the initiators as well as other participating stakeholders such as the people that helped the crowdfunding of *Smart Citizen* in the beginning. For example, in some pilots difficulties have been felt to raise the confidence and effective motivations of stakeholders to lead a pilot. Therefore, the initiators decided to use complementary coaching to empower leading stakeholders to follow on with the activities. A study of the project showed the importance of the orchestrated championing in facilitating community engagement; helping individuals to form bonds and overcome challenges associated with the lack of technical skills and data reliability (enhance competences of participating stakeholders). Pilot leaders emphasized the importance to adopt a posture of cooperation with the community in being positive, empathic, realistic, and responsive towards local needs and “innovative practices”.

For *Lab of Collaborative Youth (LoCY)* it is important to note that, in the process of co-creation, a context analysis and mobilisation of the youngsters eager to engage in the project are the first two tasks in the preparation phase. Firstly, the students’ needs and motivational drivers to get involved in codesign have been assessed and prioritised. Secondly, the introduction about the initiative and possibilities to address concerns through that initiative has been explained (setting and matching the expectations of *LoCY*’s capabilities and youngsters’ aspirations). A further driver was the strong motivation of two teachers. Both of them incorporated co-creation values in the development of educational activities and teaching in their classrooms.

### *Roles in Co-Creation*

We can differentiate the following roles in co-creation processes:

- The role of initiator
- The role of funder/investor
- The role of facilitator
- The role of participant

These roles are sometimes overlapping. Especially in bottom-up initiatives such as *ninux.org* one person can carry all four roles at the same time in being initiator, funder, facilitator, and participant. In contrast, most top-down initiatives have no in-person overlapping. These co-creation processes have a clear divide of roles and functions

including a funding institution (e.g. connected to an EU Innovation Action), a stakeholder group of initiators (e.g. public officials in a municipality), facilitators (e.g. a Service Design Agency) and a group of participating stakeholders (e.g. citizens). Although, in between, there is a great variety of role differentiation and overlapping. For example, in the case of *Sharing City Umeå – Framtidens Mobilitet (Mobility of the Future)*, the funding institution and programme motivated and supported the initiation of the project in the first place. In the case of *Den Koldioxid snåla Platsen - Klimatvisualisering Innovationsprint*, the initiators (employees of the municipality) have also participated in the co-creation process by actively engaging in the innovation sprint method. A further example is the *Lab of Collaborative Youth (LoCY)*, where the group of initiators of the co-creation process are also the main facilitators of the co-design process.

In the following paragraph, some lessons learned are summarised about the different roles of stakeholders participating in co-creation processes and their motivation in it. First of all, municipalities can be strong proponents of co-creation processes, supporting project implementation, and the engagement of other actors in the co-creation activities. A combination of personal motivation, trust, and support for co-creation can bring innovation into a system. Another driver of co-creation is the capacity of initiators to identify, involve, and maintain the engagement of participating stakeholders over a long period of time (create and maintain personal commitment). This corresponds to the fact that if initiators connect well to existing communities the latter are more likely to become engaged in co-creation processes.

Furthermore, creating competences for facilitation and/or to enable others to develop competences for facilitation (being agile, designing and sharing tools, etc.) is an important driver. This means that the ‘role of facilitation’ is an important prerequisite for successful co-creation processes. Facilitators can be professionals, e.g. designers in Service Design Agencies, etc. On the other hand, other actors can become a facilitator through learning-by-doing as in the case of *Smart Citizen*, where training and motivating “community” champions increased the level of stakeholder engagement. In bottom-up initiatives, facilitators are often the same actors as the ones initiating and participating in the process. Additionally, enhancing peer-support mechanisms between participants can increase motivation and ensure a sense of responsibility and ownership for the co-creation process (e.g. *LoCY*). If the role of the facilitator is performed by professionals, e.g. a Design Agency/consultancy, this can help a process in several ways. First of all, a ‘neutral

facilitation' can enhance trust among stakeholders as participants in a way that creates a *safe-space* for cooperation. Furthermore, it might support the willingness of certain actors (e.g. the initiators) to set-up a co-creation process in the first place, because the group of initiators will then not be responsible for conducting the process themselves. This applies most of all to top-down processes (e.g. *Sharing City Umeå - Framtidens Mobilitet (Mobility of the Future)*). Another obvious reason for contracting professional facilitation is the expertise of service design experts etc. People that specialise in co-creation and co-design approaches contribute their competences and knowledge in developing and conducting collaboration processes. This includes that experts in facilitation can adapt approaches and methods to specific challenges and contexts easier than non-trained actors could do. Furthermore, trained co-creation facilitators often support documentation and communication about the process. Thereby, transparency about and accessibility to co-creation processes is increased and lessons learned are captured.

Barriers to co-creation can be related to the 'conflicting pluralisation' of visions of the stakeholders as in the case of *ninux.org*. This conflictual dimension, involving alternative visions about the possible developments of the network, appears as a constitutive and dynamic element of the process of co-creation in that case. In the case of *Engineering Comes Home*, a barrier to co-creation was the dominance in discussions by some participating stakeholders whereas others were rather side-lined. Furthermore, stakeholders with specialist knowledge can influence decisions more effectively in a positive sense, but can also hamper the process if others feel intimidated by them. General barriers for not participating in co-creation (or not often participating) are competing priorities in work and family life. This is a clear barrier to citizen engagement. Though, competing priorities can also be a barrier for institutional/organisational stakeholders (e.g. *Den Koldioxid snåla Platsen - The Sustainable Restaurant Network*). On the side of initiating stakeholders, scepticism towards the resource intensity and outcomes of co-creation processes might be a barrier. Though, participating in co-creation processes can change this scepticism towards a more positive attitude (e.g. *Den Koldioxid snåla Platsen - Klimatvisualisering Innovationsprint*).

## 6. Co-Creation Ecosystems: Triangulating SISCODE Knowledge Base, Case Studies and Innovation Biographies

In this chapter, the triangulation of SISCODE's empirical research is presented, connecting the Knowledge Base with Case Studies and Innovation Biographies. The aim is to create a comparative understanding on co-creation at the intersections between science and society in Europe. Results are synthesised into a structured and comparative way, leading to the evidence-based refinement and adaption and a first categorisation of co-creation across Europe and its elements, including examples of good practices. The comparative analysis is based on the ecosystem model of Co-Creation Ecosystems (see figure 10).

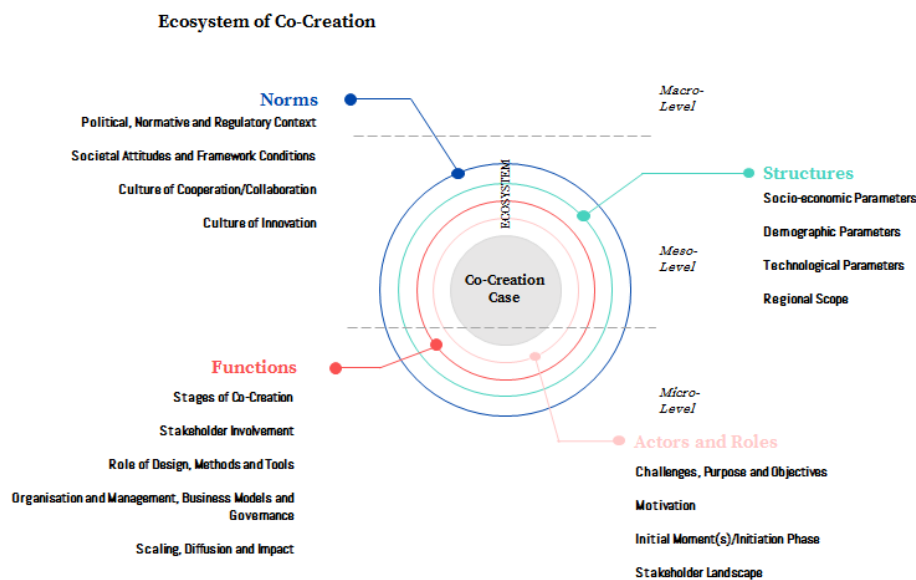


Figure 10 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

### 6.1. Co-Creation Ecosystems: Norms

This section covers aspects of the normative and regulatory contexts in which co-creation actions happen as well as detailing their influence on the process. We compare economic, political, and societal norms and values (imperatives) towards cooperation, transparency, and co-creation looking at the data that was already provided in the Knowledge Base and further explained in the Case Studies and Biographies. This includes a closer look at structural features of the co-creations' ecosystem, institutionalised behaviour of actors

below the legislative level as an expression of specific cultures of communication, living, working, innovating, etc. Finally, we try to grasp the ‚Spirit of cooperation‘ in each case.

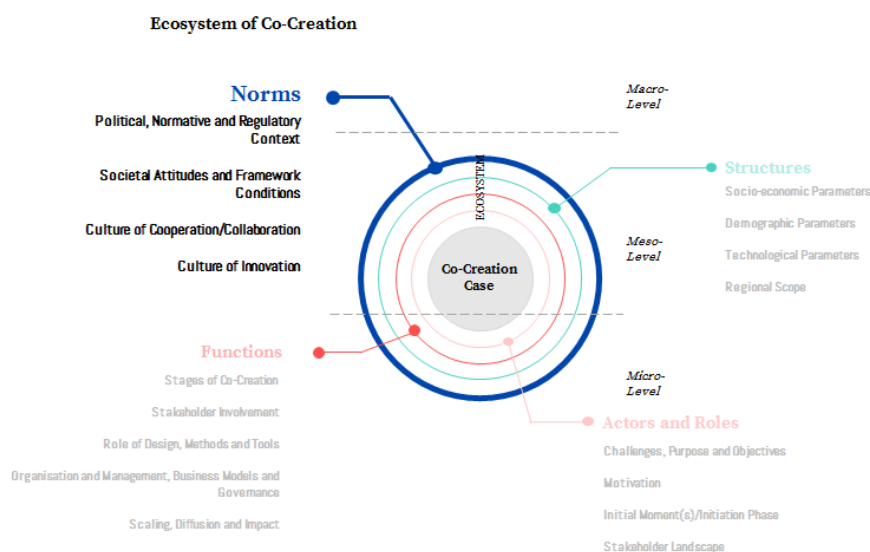


Figure 11 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

In the Knowledge Base, the context of normative, political, and regulatory frameworks was not examined in detail. However, some questions of the survey were related to lessons learned which could be clustered as learnings about ‘normative settings’ and learnings about preconditions. Overall, many answers pointed into the direction of a general necessity of changing societal mindsets towards the possibilities and benefits of co-creation. This would go hand in hand with a stronger institutionalization of co-creation in society and societal sub-systems such as innovation systems. The following table 4 summarises the findings in the Knowledge Base:

Table 4 Lessons learned ‘Normative settings and precondition’ (D2.1 SISCODE Knowledge Base)

Lessons learned	
Normative	Bureaucracy of engaging minor youth/students (12-16, 16-18) in co-creation is time consuming and unpredictable
	Consider the respective legal background, especially in cross-national initiatives
	Generate a deep understanding of public procurement and its legal regulations



	Co-creation may be in contradiction with current legal framework that regulate the service delivery in public sector
	Clear expectation reconciliation with and better information to parents from the beginning in order to engage a diverse group of kids from all genders and addressed ages
<b>Preconditions</b>	Creating a pleasant, trusting and safe working atmosphere through mutual support to avoid power dynamics/ asymmetries (Strengths based approach)
	A follow-up is important to check the effectiveness and sustainability of the project
	Political support and management back-up need to be ensured, especially in co-creation efforts in policy making
	Building up trust in co-creation means to take effort in persuasion on the spot, where the people live
	Openness and transparency as well as general willingness to make generated knowledge available open source
	Strengthen the importance and promotion of social innovation in society and develop supportive infrastructures to empower citizens and co-creation: e.g. introduce a system of valorisation of voluntary work and support an inclusive participation in the network that not only recognize technical skills, but all the activities that are collateral to the development of the community

From a triangulation of these findings in relation to the Case Studies and Biographies we gained deeper insight into the specifics of normative and political contexts of co-creation. With regard to political influence by different political stakeholders (local politicians, scientific committees) that might enable or hinder certain developments in co-creation the cases highlight (see 5.1 political influence):

- Access to funds on all political levels
- Legitimacy through political stakeholders, such as local politicians, scientific committees.
- Promotion of political strategies/agendas/projects
- Expectation for problem solutions, e.g. new technological developments as a result of co-creation

On the other hand, there are also cases where core stakeholders of the co-creation process are having an influence on political stakeholders. For example, this is the case with *ninux.org* where some members of the community are engaged in lobbying activities, both at the national and European level, aimed at renewing the regulatory framework about digital telecommunication in a way to support and encourage the constitution of broadband symmetrical digital telecommunication services in cooperation with non-profit and cooperative Internet Service Providers. Furthermore, in the case of *NESTA & 10:10*, the projects influenced the local strategy of increasing the local areas' heat networks. Similarly, in the case of *Engineering Comes Home* the Borough Council of Southwark learned from the project and now pursues an Empowering Communities programme.

Regarding 'cultures of cooperation', in almost all cases conflicts were of low intensity. In many cases, the reason for this is that the 'stakes' in the co-creation were not of high political relevance or related to a change in (e.g. major financial) resource distribution. Therefore, if conflicts arose during the process they could be dealt with through facilitation and mediation. In terms of cooperation, several Biographies described drivers and barriers for collaboration and how it had been handled.

Furthermore, the political and regulatory frameworks are closely connected with innovation policies and culture of innovation on the organisational level in the respective context. To examine a 'culture of innovation', we distinguish three categories of innovation systems and culture for the examined Biographies. These categories comprise innovation actors (e.g. funders, initiators) and actions (e.g. policies, funding schemes), on all political levels (EU, national, regional, municipal). For reasons of simplification, at this point, we do not differentiate further between innovation systems and innovation culture as well as between innovation policies on different policy levels. Rather, we try to grasp the notion 'innovation' in each case.

*Co-creation in a mature innovation system and culture:* Several of the cases describe co-creation initiatives that are derived from and are embedded in distinct innovation systems that also consider RRI in innovation strategies and funding schemes.

*Co-creation in an emerging innovation system and culture:* Several of the cases describe co-creation processes that have been started under preconditions of a rather emerging innovation system and culture which means that support structures for innovation actors and actions are not yet distinctive, especially with regard to RRI.

*Co-creation in an early-stage innovation system and culture:* Some of the cases can be characterised as early-stage innovation systems and cultures where innovation actors and actions are not yet in place and bottom-up co-creation initiatives do not receive support from an advanced innovation system in the field.

In summary, it has been found, that funding authorities do not only set the frame for themes that organisations can apply for, but they can also set the frame on how projects should be conducted. Here, we see a strong proponent for co-creation. Many of the Biographies investigated the use of co-creation approaches because of funding-requirements in the innovation policies and innovation policy instruments used on all political levels (EU, national, regional, and municipal).

Co-creation practices are sometimes more ambitious than the (innovation) political framework they are embedded in. Many of the cases use co-creation in the context of (urban and regional) sustainability governance. Here, we see a strong link between innovation policies combining co-creation as part of collaborative governance with sustainability challenges on the urban and regional level. Generally, it seems there is more promotion of co-creation in the policy field of business, technological development and employment (*inDemand*, *Smart Kalasatama Well-being Centre*, *Apulian ICT Living Lab*), whereas in other policy fields RRI and co-creation do not play a major role so far and are not as strongly acknowledged by political stakeholders and innovation actors (*LoCY*, *LTsER Montado*, *PIKSL*).

## 6.2. Co-Creation Ecosystems: Structures

This section covers aspects of the structural contexts in which co-creation actions take place as well as their direct influence on the process. The results from the Meta-Analysis, Case Studies, and Biographies are synthesised in a structured and comparative way. Specifically, socio-economic and demographic parameters as well as the scope of co-creation are addressed.

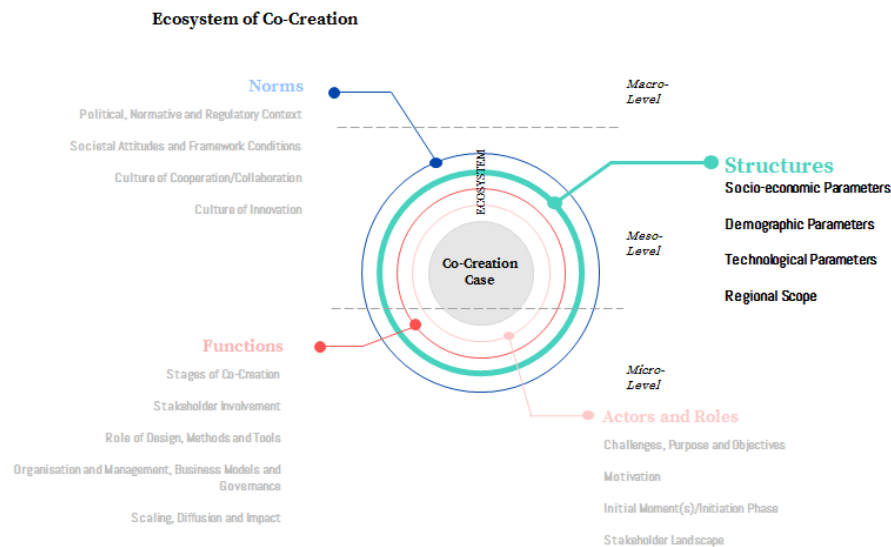


Figure 12 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

### 6.2.1. Socio-Economic Parameters

Projects under scrutiny take place in various socio-economic settings, in metropolises as well as in rural vulnerable urban areas. Thereby, they face diverse *socio-economic challenges* as the Knowledge Base, the Case Studies, and the Biographies show. They address health, demographic change and wellbeing issues, issues of climate action and environment, sustainability, smart transport, aging societies, restructuring of economic structures, etc. Besides this, also *cross-cutting themes* play a role in the projects. This is seen more in the Meta-Analysis rather than in the Case Studies and Biographies in which specific co-created practices are focused, unfolded, and further examined.

On top of this, the qualitative analysis of Case Studies underlines that socio-economic parameters characterise a co-creation ecosystem. Corresponding to the Case Studies, this can be the condition under which the project applies co-creation while there's also the possibility of it being the socio-economic challenge itself. Thus, socio-economic parameters seem to be relevant for ecosystems, especially in co-creating and facing socio-economic challenges.

### 6.2.2. Demographic Parameters

Concerning the socio-demographic context, the Knowledge Base provides first insights on 138 cases of co-creation concerning the geographical distribution (see T2.1 in WP2 p. 8) and the number of countries the cases are related to (see T2.1 in WP2 p. 15). The Knowledge Base shows that the cases are both from EU countries and non-EU countries. This is also seen in the Case Studies and Biographies because they range, for example, from European metropolises up to the African rain forest. Moreover, the Knowledge Base also highlights that there are cases associated with only one country, whereas others are related to more than one. This confirms the point already made in the Case Studies section: Numerous co-creation projects cover more than one place of action – if the initiative is an EU project and it has to distinguish between the places of action a project covers and the explicit single place of action. That can be called the **primary ecosystem** in which co-creation is applied. In this regard, primary ecosystems can be seen as fruitful approaches to describe structures that set the frame for co-creation.

One other point concerning ecosystems is that the analysis of the Case Studies shows that working in more than one ecosystem is useful to create universal solutions. Accordingly, the examples show that a deep understanding and awareness of the special conditions of each ecosystem is necessary in order to establish a successful initiative as well as to implement a successful co-creation process.

Another central aspect is the *level of action*. Projects can act on a lower geographic level (local, city, regional) or a higher geographic level (EU, non-EU). Especially the Case Studies showed that these levels can constitute ecosystems, whereby the development is decided mainly in the primary ecosystem. This is the reason why the geographic level of action is also linked to ecosystems what is mainly seen in the Case Studies and to some extent in the Meta-Analysis as well.

Overall, the Case Studies and Biographies outline that the *socio-demographic context* of co-creation is relevant. The socio-economic, as well as the demographic context, play a major role in co-creation processes. This can be seen in the Case Studies and in the Biographies, whereas the Meta-Analysis just provides a first insight on its importance. Besides this, co-creation can also be linked to the interrelation of socio-economic and ecological contexts of a region. This can specifically be seen in the case of *LTsER Montado*, where the co-creation process is centred around the preservation of Portuguese oak tree forests with the socio-economic significance of the trees to preserve species. Moreover, this case also shows that communities are aware of the societal challenges and socio-economic implications. So,

**communities** can be related to the socio-economic context and the interlinkage of them and the context can be seen as one main background of co-creation processes with also networks and stakeholders playing a central role.

### ***Territorial Scope***

The Meta-Analysis outlines the territorial scope of the projects as one indicator for co-creation's heterogeneous modes of work and forms of existence (see D 2.1 p. 19). Most of the Knowledge Base cases focus on the immediate living environment of people – either the neighbourhood, the urban district or the city (*ibidem*). 53 cases reach out further and address the regional or national level, whereas others (30 cases) work on issues on an international level (*ibidem*), with 21 cases' scope on the EU level and 9 cases with a worldwide scope. On a **local level**, projects primarily enable citizen engagement in various ways and apply co-creation primarily to including residents/citizens. This is the reason why co-creation processes play an important role on the local level – to engage people, especially citizens and residents, co-creation processes have to be on the local level, where their immediate living environment is in focus. Besides this, there are also projects on the local level which are distributed over different cities or which start in one city and then spread to others. In doing so, these projects are extraordinary examples because they scale up from local to the **regional level** by spreading to other cities, neighbourhoods or urban districts. As the Case Studies and Biographies show, projects that are clearly operating on the regional level have co-creation processes in different regions in Europe or in just one region in one country. Thus, the regional level is more extensive than the local level. However, there are no co-creation processes that tackle issues on the **international level** in the Case Studies as well as in the Biographies. This is only seen in the Meta-Analysis. Overall, as all three data sources show, the scope spreads over three levels:

Table 5 Territorial Scope

Level	Territorial Scope
Local	Living environment of citizens, neighbourhood, cities, urban districts
Regional	Different cities, neighbourhoods, urban districts in one country as well as different regions in Europe or in one country
International	Worldwide

To sum up, all three data sources (Knowledge Base, Case Studies, Biographies) show that socio-demographic and socio-economic parameters are often linked to the level (local, regional, international) co-creation tackles on. Thereby, it came to light that the consideration of socio-demographic parameters, socio-economic parameters as well as the scope before the start of the initial co-creation process is quite fruitful and important. Thus, socio-economic and demographic contexts and the scope should be considered simultaneously in co-creation processes.

### 6.3. Co-Creation Ecosystems: Functions

This chapter triangulates the qualitative and quantitative results for the analysis of the inner ecosystem layer of functions adapted for SISCODE based on the model by Kaletka et al. (2017) and presented in chapter 3.4. It considers the level of the individual co-creation processes, as well as the further development of co-creation and the level of organization and management.

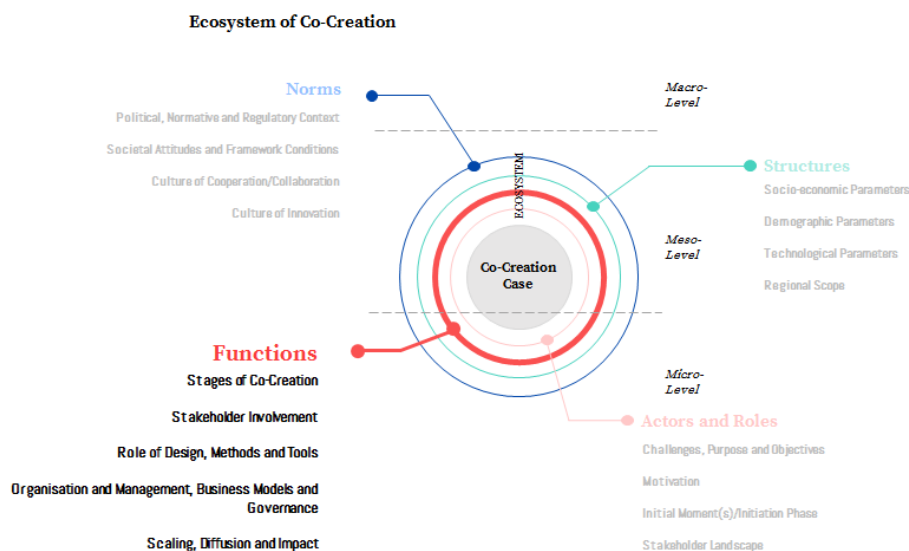


Figure 13 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

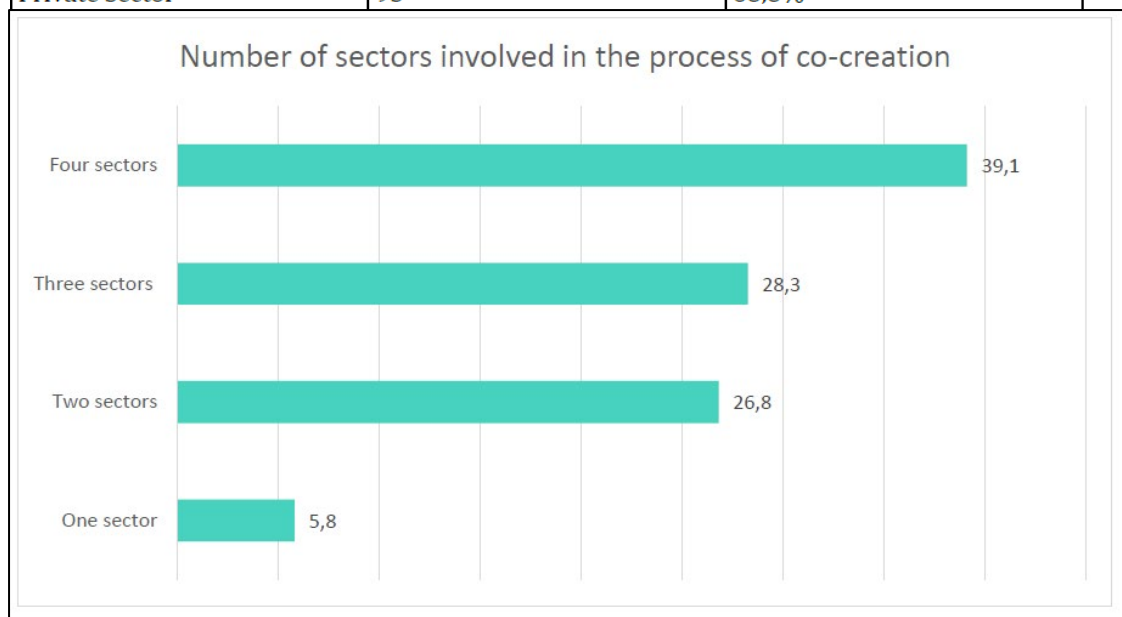
### 6.3.1. Co-Creation Process

#### *Selection and invitation of participants*

As all three data sources show, stakeholders from a variety of different sectors are invited to co-create in the cases. First of all, all four sectors of the quadruple helix of knowledge production (Carayannis & Campbell 2009) were found co-creating throughout the cases and the different levels of analysis (see table 6).

Table 6 Type of sectors involved in the co-creation activity (SISCODE D2.1)

Sector	N	% of cases
Civil Society	115	83,3%
Public Sector	103	74,6%
Academia	96	69,6%
Private Sector	95	68,8%



For the overall collection of co-creation cases in the Knowledge Base (SISCODE D2.1), all four sectors were named to be involved in co-creation activities in more than 39% of the cases and at least three sectors were even involved in more than 67% (see figure 14).

For the meta-perspective of societal domains, this finding points at a general openness of actors from different siloes (i.e. societal areas focussed on their own perspective without taking external perspectives into account) opening up for co-creation and by this, also for cross-silo collaboration.



However, while the largest share of cases in the full sample (i.e. Knowledge Base) was characterized by involvement of all four defined societal sectors, there was still a majority of cases (more than 60%) inviting or co-creating rather selectively and based on rather functionalistic decisions, as the qualitative comparative analyses revealed. Hence, even if there was an opportunity to include stakeholders from different or all societal domains, it was not always put in practice if not being coherent with the aim of the co-creation activities.

Looking into findings of the Knowledge Base (SISCODE D2.1) again, a wrong selection of stakeholders (hence participants) was named as a major barrier for 16% of the cases. While it remains unclear whether this was directly linked to the (wrong) selection of sectors, it still points at room for improvements that could possibly be addressed by opening up for more sectors in cases where only a limited amount of sectors was involved.

While different sectors have been involved across the cases, also different groups of external stakeholders were addressed across all cases as shown in table 7. However, among these different stakeholders, the “affected population” (SISCODE D2.1) (e.g. citizens) was the least seen group involved in the co-creation activities. While they were still involved in more than 44% of the cases, this aspect underlines a lack of integration of the user perspective named as a barrier for 32% of the cases (see SISCODE D2.1).

Table 7 Stakeholders involved in the co-creation activity (SISCODE D2.1)

Addressees/ users/ beneficiaries	N	% / cases
Single citizens/ interest groups	117	84,8%
Civil Society Organizations	82	59,4%
Consumers/ Users of a specific product	73	52,9%
Business/ Economy	86	62,3%
Employees and volunteers	75	54,3%
Affected populations (e.g. people with disabilities, refugees etc.), namely	61	44,2%
Others, please specify	41	29,7%
total	138	

Generally, most cases feature a relatively high diversity of different actors. As the Knowledge Base (SISCODE D2.1) already summarized for the Meta-Analysis of all cases, diversity is generally aimed at in many cases on purpose. Hence, in the survey, different recommendations were made, which are suggested to achieve diversity in co-creation activities (see table 8). Among these recommendations, three different categories can be identified: (1) recommendations, which focus on themes and their relation to achieved diversity. Especially technological themes seem to be an issue. Hence, it is suggested to connect such themes to other themes to attract different groups – for technology, especially females are mentioned. (2) Recommendations were made, which focus on the selection and invitation of participants: specific groups should be invited and pathways to reach participant target groups were named, like identifying and involving target group members who could make it easier to approach other target group members. Furthermore, the recommendations for participant selection and invitation do also emphasize a need for thoughtful procedures in respect to both in order to achieve diversity. (3) A general recommendation was made, implying that a consideration of diversity should not be made based on stereotypes.

Table 8 Strategies for achieving diversity (SISCODE D2.1)

<b>Recommendations to cope with diversity aspects related to themes of co-creation (esp. technological themes)</b>	» <i>Connecting ‘woman’ and ‘man’-connoted topics: e.g. combining digital and technological driven developments with social/care issues</i> «
	» <i>Connecting ‘youth’ and ‘elderly’-connoted topics [...]</i> «
	» <i>Research on technologies needs to be sensitive to diversity-dimensions and more diversity is needed amongst researchers themselves, especially in tech</i> «
	» <i>In tech and craft-driven activities the early engagement of girls proved to be difficult –lessons are to “have high focus on how to engage and inspire female participants from the beginning”, e.g. through happenings and events and to provide resources and support for gender awareness activities</i> «
<b>Recommendations related to participant selection and invitation</b>	» <i>Bring diverse groups of people together who might not intersect otherwise – “the needs of one group of stakeholders becomes a resource for the other and vice versa”</i> «
	» <i>Institutionalized people (e.g. in care homes) are often forgotten – for truly inclusive approaches they have to be involved</i> «
	» <i>If the participants are purposefully chosen, diversity should be initiated</i> «
	» <i>Finding multipliers in the respective group might be helpful in order to attract participants: this can be e.g. a representative from a self-help organisation, persons in workers’ councils, long-term inhabitants from a specific area etc.</i> «
	» <i>If pupils/ students are or should be part of the project it is recommended to engage/ recruit in all school forms in all urban districts alike to guarantee a diversified group of participants</i> «
<b>General recommendations</b>	» <i>A balance has to be found between drawing attention and awareness towards diversity and avoiding stereotypes</i> «

Overall, both in the Case Studies and in the Biographies the aim of realizing diverse teams of co-creators was often mentioned. However, this diversity was not always going beyond the involvement of actors from different sectors or societal domains in more general terms. At the same time, there were still cases in the sample of Case Studies and Biographies for the comparative qualitative analysis that were explicitly aiming at marginalized societal groups or at an inclusive approach in a sense of social inclusion, where society is changing itself towards achieving full participation of all societal groups. In this respect, for instance, persons with disabilities or marginalized youth were aimed at and part of the co-creators on purpose beyond their function for enhancing the outputs of co-creation.

Furthermore, going in depth on the analysis of Case Studies and Biographies revealed some hurdles for some co-creation activities when it came to the engagement of external stakeholders. Besides an issue in reaching some participant target groups, teams were generally facing reluctance among target-groups not used to collaborate across siloes or not willing to do so. Although the experience of co-creation realized in a cross-sectoral manner was supportive for changing mind-sets (see the section on complicated issues in chapter 6.3.2.) in the course of co-creation, co-creation activities were even struggling to include all targeted external stakeholders as participants right from the beginning when necessary. The analysis of the co-creation Biographies suggests that this issue could be addressed by starting the co-creation processes together with participants with an open mind-set and continuing it with further individuals as soon as they become interested in joining others in the already existing and proceeding process.

As analysis for all three data sources shows, external stakeholders were invited to co-create via different means. The distribution of responses for the Knowledge Base (SISCODE D2.1) already revealed that there seems to be no clear preference for means in the quantitative sample. All suggested forms of invitation were used in a significant share of cases with at least 50.4 % of responses (see table 9). The same applies to the qualitative samples of Case Studies and Biographies, where invitation strategies were rather oriented individually towards the respective target groups. Both the Case Studies and the Biographies showed that there was a tendency of reaching rather delimited target groups (e.g. local or regional) via personal appeal or personalized invitations. In contrast, open forms of invitation were rather used when target-groups were less specific (e.g. international) or where there was no channel available (or identified) to access these desired participants directly in a more tailored way. However, such open invitation procedures seemed to be less successful throughout the Case Studies and Biographies compared to more targeted approaches.

Furthermore, external stakeholders supported the co-creation activities by providing access to target groups and were therefore especially supportive for realizing more targeted approaches or for making them possible due to their connections.

Table 9 Forms of Invitation (SISCODE D2.1)

Invitation forms	N	%
Personalized invitations	91	69,5
Personal appeal to relevant target groups	91	69,5
Promotion on specific events	84	64,1
Open invitation per mail shots/ open advertising	66	50,4
Other, please specify	8	6,1
total	131	

#### *The function of stakeholders in the co-creation processes*

In the qualitative comparative analysis of both, Case Studies and Biographies, it became clear that external stakeholders are invited to co-creation for different scopes, hence taking up different roles in the process. For many cases, they are necessary knowledge providers, hence experts for their user-perspective, their domain, or for a research field. Additionally, external stakeholders (e.g. end-users) are also invited to give feedback in different phases of co-creation – for instance at the beginning when it comes to evaluating ideas or at the end of single iterations or non-iterative processes, where tests are conducted and prototypes are evaluated. Furthermore, they are also co-creators when they are serving the function of taking part in the different phases beyond consultation by contributing their perspectives and their different knowledge in the practice of co-creation, hence by taking actively part in developing solutions. Beyond the engagement of external stakeholders as participants directly in the co-creation process, they are also addressed for serving the function of multipliers, for instance when they might serve as door openers to target groups, hence for the dissemination of results and invitations to join co-creation. Furthermore, participants of the co-creation process can even contribute with resources different to knowledge (e.g. necessary tools), as the analyses revealed.

While stakeholders in co-creation are an integral part of its success by definition, in the co-creation cases they are sometimes only invited to participate in single and selected phases. Hence, some cases were rather punctually determined by co-creation whereas others were

including external stakeholders like end-users throughout all stages in rather holistic approaches, as the analysis of Case Studies and Biographies shows.

Generally, a perspective on all cases analysed in the co-creation Case Studies and Biographies suggests a distinction between different levels of stakeholder inclusiveness, which could serve as a starting point for further research towards a classification and typologies of this engagement. First, there are cases where external stakeholders are integrated into all or most phases of co-creation. In the sample, such cases tend to be rather holistic in a sense that they are aimed at establishing or testing different (i.e. co-creative) practices of creating outputs and outcomes in a defined context (e.g. an organization, a domain or a geographical context). Such cases could be called **‘Inclusive co-creation activities’**, as they are realizing co-creation in a manner where external stakeholders are co-creating more than just single phases. An example of such cases is provided by *PIKSL*, where the overall project design is putting the user in the centre and where external stakeholders are even co-creating beyond the project level – for instance by co-creating managerial decisions and by co-producing services, hence carrying out these services. As exemplified by *PIKSL*, in inclusive co-creation activities especially end-users but also other external stakeholders with interest in the project are basically invited to take part. Another ideal-typical form could be described as **‘Punctual co-creation activities’**, where external stakeholders are still actively co-creating but rather in selective phases. Again, all external stakeholders can basically be invited to co-create in single phases. However, based on the results from the analysis of the Case Studies and Biographies, it seems to be more likely that especially external stakeholders are invited who have skills or competences required for the respective phase. For instance, end-users might be invited to an early phase in order to support better a understanding of a problem they are affected by and to ideate possible solutions while not being part of the prototyping phase. In such cases, there might be a pre-defined starting point or a further development of an idea or prototype without the inclusion of external stakeholders. A third form could be understood as **‘Consultative co-creation activities’**, where external stakeholders are rather asked for their opinion on a certain aspect from single or across the development phases. In this category, external stakeholders would ideal typically not take an active part in co-creation itself. For instance, end-users might only be consulted for their opinion on a prototype. Hence, if such cases can qualify for being co-creation cases, might also be questionable. However, as long as “multiple actors and stakeholders” (SISCODE D1.2) are involved, a limitation to consultation for the contributions of some (external) stakeholder groups might still be possible in a co-

creation process by definition as long as other stakeholder groups are actively co-creating. While the consultation of external stakeholders was often found in cases in the sample, it was still rather common to combine such consultative activities with (inclusive) co-creative activities turning them into punctual co-creation activities.

However, as both the whole sample collected for the Knowledge Base (SISCODE D2.1) and the selection of cases for Case Studies and Biographies were explorative and not representative, additional categories might be identifiable together with a potential for further differentiation or a comprehensive revision that might then become a necessity. Hence, to highlight it again, this differentiation of categories is rather a first suggestion providing a possible basis for further analysis towards classification and the identification of typologies.

#### **Different categories of stakeholder inclusiveness**

***Inclusive co-creation activities:*** Stakeholders are co-creating across all development phases and sometimes also beyond on the administrative/managerial level

***Punctual co-creation activities:*** Stakeholders are co-creating in selective development phases

***Consultative co-creation activities:*** Stakeholders are not invited to co-create and remain external actors

Figure 15 Different categories of stakeholder inclusiveness

#### ***The design of co-creation processes***

As the Meta-Analysis of co-creation cases already indicated, according to the results of the assessment of the realized phases, co-creation processes in the sample feature different phases of the design process (see chapter 3.4). For the Knowledge Base (SISCODE D2.1), especially differences between the two phases of Problem Identification / Understanding and Ideation and the other defined phases of Prototyping and Verifying / Testing were found. Whereas the first two phases were named for 81.2% of the cases in the sample, the

phases Prototyping and Verifying / Testing were named to be reached slightly less with 72.5% and 71% (see table 10).

Table 10 Co-creation in the different phases (SISCODE D2.1)

Co-creation phase	Cases	%
Problem identification/ Understanding	112	81,2
Ideation	112	81,2
Prototyping	100	72,5
Verifying/ Testing	98	71
total	138	

Although this observation could lead to the assumption that the first phases, in particular, are realized and that later phases could not be reached due to the different barriers, a somewhat different picture emerges when considering the qualitative in-depth analyses. In fact, the analysis of the Case Studies and Biographies showed that there are also cases that do not realize earlier stages as part of the co-creation process - for example, when problems are defined top-down. In addition, the relatively slight differences between cases named reaching the earlier phases and those reaching the later phases in the Knowledge Base (SISCODE D2.1) already indicate that not all co-creation processes are designed in the same way. The analysis of Case Studies and Biographies confirms this observation. Here it was found that cases were often featuring individual and sometimes even selective phases of co-creation without any clear preferences for earlier or later stages. Furthermore, it could be determined that there are sometimes hardly any clear distinctions between individual phases and that the phases have also been partially tailored differently - for example, when problem-identification and idea development have been implemented in one step without any clear methodical distinction. In the Knowledge Base (SISCODE D2.1), the question was formulated whether co-creation could be considered as such if the early phases are not completed. Starting from the findings from the analysis of Case Studies and Biographies, it seems like co-creation in practice is often very individually tailored and designed as discussed above. Hence, projects may still be cases of co-creation to some extent despite not applying overall co-creation approaches, but rather using it selectively and possibly for functionalistic or even arbitrary reasons. While such cases might, therefore, not be characterized by co-creation overall, they are still featuring elements of co-creation.



Another finding for the practice of co-creation processes in the cases presented in the Knowledge Base (SISCODE D2.1) was related to iteration. Here it was found that only 69% of cases in the sample were known to have reached feedback and restart phases (see figure 16), hence have been iterated. However, it is not clear at this point whether the respondents only referred to iteration across the full process, or also to iteration between single phases or even within. In this respect, comparative analyses of the qualitative sample showed that iteration in the cases examined indeed happening between and across phases, emphasizing the non-linear character of many co-creation processes in practice at least for these cases.

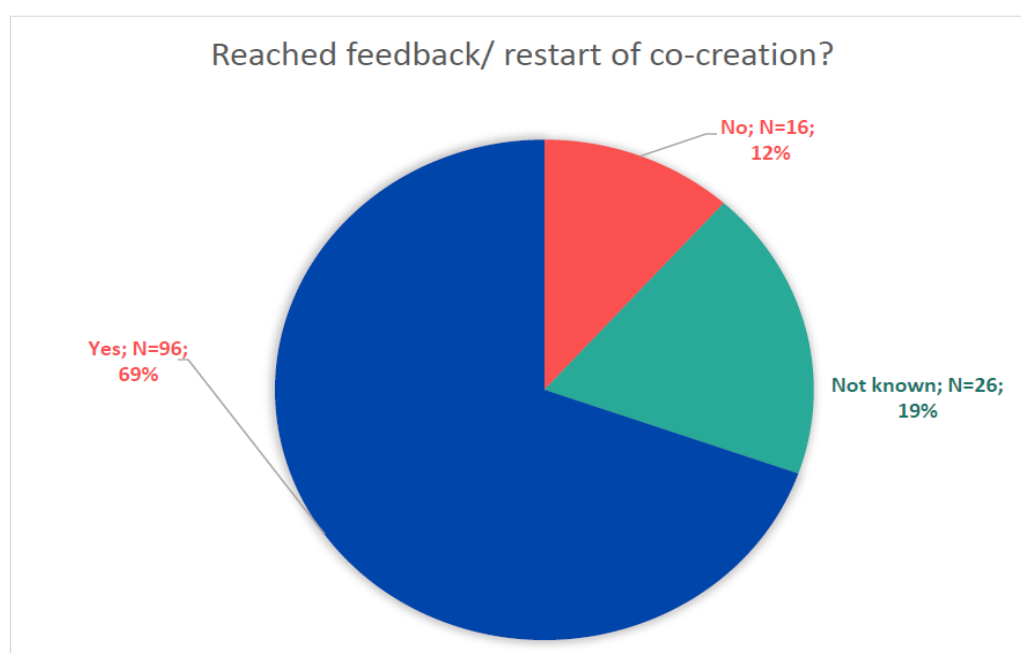


Figure 16 Did the case reach the phase of feedback/restart? (SISCODE D2.1)

It not always explicitly triggered by evaluation. However, just as iteration, it was especially realized in the final phase of Verifying / Testing, where solutions were tested by external stakeholders like end-users or their feedback was collected. Although, evaluation in the cases was also realized in earlier phases, for instance, by collecting feedback on the relevance of problems addressed or ideas that were developed. Hence, it was also a trigger for iteration not only at the end of a co-creation process but also within and between phases of co-creation.

### *Communication in the co-creation processes*

For the Meta-Analysis, two responses providing information on the role of communication in the co-creation process were collected (see table 11). The first one emphasized the role of choosing the right style of communication – in this case by the use of ICT tools. As the in-depth analysis of Case Studies and Biographies revealed, choosing adequate communication in terms of both channels and language was generally an important factor for the cases in the sample. However, while ICT tools like knowledge sharing platforms were utilized to communicate pure knowledge, there were various further strategies chosen to communicate in the process of co-creation. The most important factor in this respect seemed to be a communicational approach that was considering the specific needs of the co-creators. For instance, complex knowledge had to be translated into different terms, the native language had to be chosen and visual communication was supportive in communicating information that was likely not to be understood otherwise.

Table 11 Excerpt from ‘Lessons learned in the process’ (SISCODE D2.1)

Communication	
	“Collect feedback and inform about the given feedback – stay in touch with partners as much as possible to maintain relations”

The second response for the Knowledge Base (SISCODE D2.1) shown in the table highlights the importance of communicating feedback and keeping contact with partners. While the second aspect does not directly link to the co-creation process itself, the first one is in line with findings from the qualitative analyses in earlier chapters of this deliverable, where it was highlighted that the experience of co-creation – and the integration of the user-perspective in particular – could convince participants first sceptical of its potential, hence change their mind-sets. Communicating valuable user feedback was one building block in this regard, emphasizing the value of integrating the users’ perspective.

*Tools and methods*

Tools and methods named in the Case Studies and Biographies feature a great variety spanning across design tools and methods and rather traditional collaborative and participative means to rather research-driven ones. Hence, tools and methods named for the Meta-Analysis were also found in the qualitative analyses, showing no clear preference for a set of specific tools or methods. However, responses collected for the Knowledge Base

(SISCODE D2.1) still show some differences as exemplified by tools and techniques for user-understanding in table 12. As already discussed in chapter 4.3, the differentiation of tools and methods in practice and in the Case Studies and Biographies is not always consistent. This is also reflected in table 12, where some “tools for user understanding” (SISCODE D2.1) are rather methods than tools. As explained in chapter 4.3, tools are directly facilitating practices of co-creation while methods are rather providing a framework to carry-out co-creation. In this sense, both prototyping and testing do not qualify as tools and also not as methods; hence they are not discussed here. Much more, they are a phase of co-creation (see chapters on the co-creation process in 4.3, 5.3 and above). Based on the proposed differentiation between tools and methods, co-design tools (which were not specified) and visual/tangible outputs qualify as tools. While the first were used in 69.9% of the cases, the second were used in 63.2%. Hence, such tools were used in a larger share of cases. Methods shown in the table are represented by interview techniques and gamification techniques. While the first were also found in more than a half of the cases (61%), gamification techniques were less common with 22.8%.

Tools for user understanding	N	%
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Table 12 Tools and techniques for user understanding (SISCODE D2.1)

Prototyping and testing	90	66,2
Visual/ tangible outputs (e.g. audio clips, drawings, writing, photo diaries...)	86	63,2
Interview techniques (e.g. focus group interviews, narrative interviews with end-users...)	83	61
Gamification techniques (e.g. Lego Serious Play)	31	22,8
Other, please specify	35	25,7
total	136	

When looking at a rather superordinate level, in the qualitative analysis of Case Studies and Biographies, workshops proved to be a method to frame co-creation in practice. These workshops had different forms and therefore they are not a clearly distinguishable method on their own. Much more, some specific approaches like design-thinking workshops or hackathons were found as well as methods like world cafes or open discussions providing the elements of the workshops. Furthermore, also methods not necessarily linked to workshops, like real-life experiments or interviews, were found in cases where evaluation and testing was conducted under real-life conditions or where feedback from external

stakeholders was collected in different co-creation phases (for more information, c.f. chapters 5.3 and 6.3).

Tools and methods seen in the co-creation processes analysed from the qualitative sample were utilized for different goals. For instance, some (tangible) tools like paper prototypes were used to support the prototyping process, whereas other tools were much more aimed at enhancing communication or understanding or simply welcoming new co-creators, hence creating a welcoming atmosphere. Generally, both tools and methods were often aimed at enabling a different environment of collaboration than participating stakeholders were used to. Hence, e.g. policymakers were invited to co-create policies utilizing design tools and methods for the first time, or citizens were confronted with new technologies and respective tools for the first time.

### *Time and space*

As already described in the section on the design of co-creation processes, not all co-creation activities in the sample were carried out throughout all phases. In the Knowledge Base (SISCODE D2.1), especially timely constraints were named as a major barrier to the consistent development of co-creation (SISCODE D2.1). This is in line with the finding from the analysis of the co-creation Case Studies and Biographies from the same sample. Especially for time-limited projects, hurdles in finalizing or further proceeding co-creation processes were found. This was, at the same time, often related to time-limited funding and a lack of opportunities for follow-up funding. Furthermore, the Case Studies and Biographies showed that successful co-creation processes often need time. In some cases, it was necessary to invest time for enough iteration, for other cases it was shown that building trust and understanding among participants could be addressed by means of time-consuming processes. The same applies to building some partnerships and sustainable networks or communities. Overall, the qualitative analyses underlined the importance of having enough time for co-creation processes on different levels.

Another important dimension for co-creation cases in the sample was space on different levels. First, in the Knowledge Base, the role of “safe space” was mentioned as a factor for “shifting power dynamics” (SISCODE D2.1). In the same open response, the role of a room for this purpose was mentioned. While the first aspect also strongly relates to the aspect of power asymmetries that have been found as a barrier hampering co-creation and creating mismatches, the second aspect does also emphasize the role of physical space. In the qualitative analysis in chapters 4 and 5 of this document, physical space is described as a

crucial resource for some projects, especially those conducting physical meetings or using physical tools placed in physical spaces. Furthermore, physical space as the location of co-creation was sometimes also found beyond rooms, e.g. where real-life experiments were realized in a specific target area or where field research was conducted on the outside.

Beyond physical space, also virtual space provided the basis for co-creation in some cases – especially where it was realized across distances, hence decentralized.

### 6.3.2. Further Development of the Co-Creation Process

#### *Development of partnerships and networks*

Already the Knowledge Base (SISCODE D2.1) highlighted the importance of networks and partnerships to individuals and groups as it was named as the most important driver of co-creation across the full sample with relevance for more than 72% of the cases (see table 13).

Table 13 Drivers to unfold potential

Drivers to unfold potential	N	% of all cases
Individuals, networks or groups	100	72,5
An overall innovative environment	88	63,8
Possibilities through ICT	55	39,9
Governance and politics	53	38,4
Financial resources	53	38,4
Urgent needs and demands	46	33,3
Other, namely	15	10,9
Number of cases	138	

Furthermore, other responses for the same question were underlining the importance of the role of partnerships indirectly by mentioning the supportive role of politics (and governance) and financial resources, which were sometimes accessed with support from partners, as the qualitative analysis confirmed. Furthermore, both the Meta-Analysis and the analysis of Case Studies and Biographies revealed other resources provided by partners (see figure 17). According to the results collected in the diagram, especially knowledge proved to be a resource often provided by partners. While the term of knowledge could not be specified any further in the standardized responses, this result is generally in line with the observation that participants included in co-creation were often serving the function of knowledge providers as stated above. Hence, they were providing their knowledge as well

as related skills and competences. Furthermore, partners in the cases were providing support in idea development. Here it remains a bit unclear whether this was always realized in a co-creative manner or also upstream the co-creation process – as also discussed for the section on the design of co-creation processes and their co-creative character. Another important role of partnerships – be them developed in the course of co-creation processes or before – found by both Meta-Analysis and qualitative analyses of Case Studies and Biographies, was support in dissemination. Similar to this aspect, support in lobbying was also provided by partner organisations according to the Knowledge Base (SISCODE D2.1). The same is true for infrastructure and personnel, which were also provided by partnerships developed in the course of co-creation activities.

### *Scaling and Diffusion*

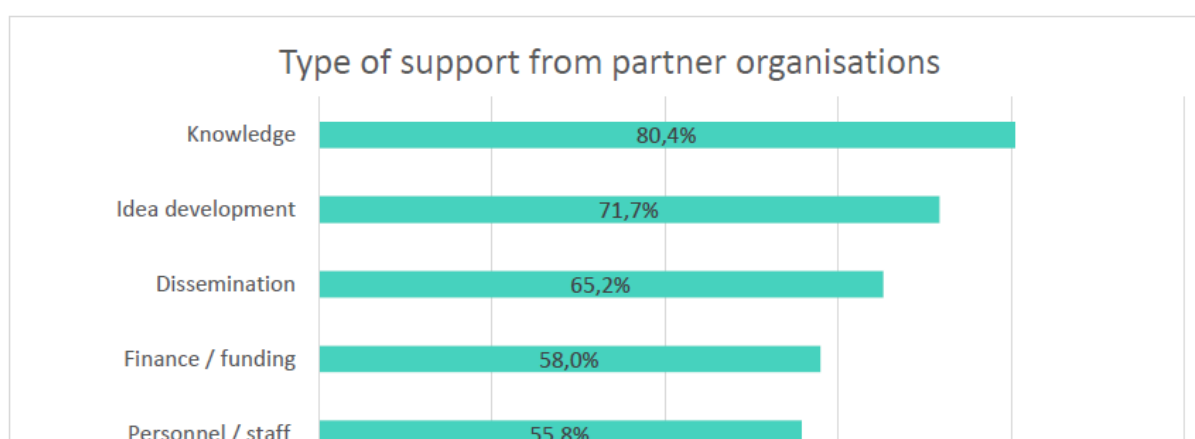


Figure 17 Type of support from partner organisations (SISCODE D2.1)

Both, the analysis of the Case Studies and Biographies revealed a general tendency of co-creation activities to be carried on and scaled in further activities – be it starting from follow-ups, scaling it in the target area or other contexts or even striving for social changes and shifts in a specific area.

As the analysis of the Case Studies and Biographies showed, most cases were featuring some kind of follow-ups. On one hand, this often applied to cases where the co-creation process itself was already built on a variety of previous events and activities. On the other

hand, this was also found for cases where activities were repeatedly realized in the same way or in a similar form. However, there are also some cases where follow-up activities were obstructed by a lack of resources, be it time or a lack of funding in projects or programmes or for other reasons like a lack of supportive partnerships.

The co-creation processes selected for the Case Studies and Biographies showing signs of upscaling were found to be taking very different pathways. Sometimes, the core idea or approach was diffused, sometimes the cases developed projects, following the same or a similar approach. In other cases, the approach was adapted to other contexts by the responsible partners themselves or by external stakeholders or partners. Furthermore, some co-creation initiatives were also scaled up into institutionalized forms like organizational units. Supportive to scaling up processes were not only partnerships taking up or at least spreading information on the approach, but also awards or prizes given by known external actors that helped to increase awareness for the co-creation activities.

Generally, many co-creation activities in the sample were aiming at a greater systemic change within the targeted context. Among these cases, a notable share of those described in the Case Studies and Biographies was striving to establish co-creation as a new practice in a specific context of interest like policy-making as well as directly in their organization. Such goals were often related to a somewhat holistic approach not only addressing systemic change in the environment of the case but also establishing and using co-creation in their practice and – much more important – in its organizational context. Such cases may therefore often be described by the category of ‘inclusive co-creation activities’ proposed in section 7.3.1. Furthermore, the analysis of the Biographies revealed that systemic change achieved by the cases in the sample in general and especially in the short term benefitted from the support of quadruple helix partnerships. Other than that, systemic change usually needs time, which again links back to the importance of having enough of it available to allow co-creation to develop sustainably.

### *Complicated issues related to interaction of participants*

Cases in the sample were facing different challenges and found different solutions discussed in this document. However, as co-creation is built upon interaction, the most important hurdles were found when it came to mismatches, communication issues, or conflicts among participants. The Meta-Analysis already revealed that especially “divergent conceptions towards crucial concepts”, incompatible “wording and language”, “power-asymmetries” and “ideological mismatches” (SISCODE D2.1) were the problems identified as the most frequently occurring ones (see table 14).

Table 14 Mismatches in carrying out the co-creation activity (SISCODE D2.1)

Mismatches	N	%
Divergent conceptions towards crucial concepts	40	37,7
Wording and language were not compatible	34	32,1
Power-asymmetries	33	31,1
Ideological mismatches	25	23,6
No mismatches at all	33	31,1
Other, please specify	11	10,4
total	106	100

Although there was also a significant share of cases for which no mismatches were named at all, similar mismatches were discussed in the qualitative analyses in this deliverable. As for the divergent conceptions, communication proved to be key in order to create mutual understanding and also the creation of a common vision as already discussed in the sections on communication. Furthermore, communication (i.e. dialogue) was also key for addressing ideological mismatches and sometimes also power-asymmetries (e.g. due to decision-makers or experts not used to collaborate with citizens or laypersons), again by creating mutual understanding and shared visions in dialogue processes, which was also supportive for addressing conflicting goals. Wording and language were addressed by choosing different forms of communication (e.g. simplified language styles or visual means, see also the section on communication in the co-creation process in 6.3.1.). While communication proved to be a powerful tool, mismatches could also be reduced through the practice of co-creation itself, as both the analysis of Case Studies and Biographies showed. To be more specific, the experience of working together and successfully creating solutions together proved to be supportive for mutual understanding and changing mind-



sets as well as fostering collaboration. For the Biographies it was therefore highlighted that co-creation was benefitting from positive turning points in this respect.

Another issue found in the course of the analysis was related to a lack of trust and feeling of ownership and power among participants, e.g. relating to a lack of transparency and involvement of external stakeholders. The Case Studies showed that these issues could be addressed and tackled involving participants early in the process and from the first phases of co-creation. Moreover, as highlighted in the Biography analysis, successfully built trust has the potential to stabilize co-creation processes.

### 6.3.3. **Organisation and Management**

#### *Formal structures, management and organisation*

According to the Knowledge Base (SISCODE D2.1), the vast majority of co-creation activities in the sample were time-limited projects (71.9% of provided responses, see table 15) whereas other forms like organizations or networks without a limited timeframe were seen less. This finding for the overall sample was confirmed by the qualitative analyses illustrated in chapters 5 and 6 of this deliverable.

Table 15 Timely limited project character or not (SISCODE D2.1)

Timely limited project?	Number of cases	%
Yes	97	71,9
No	38	28,1
total	135	100

Both, cases from Biographies and Case Studies were foremost characterized by a limited amount of time. Hence, a general interest in funding co-creation across different themes and contexts with different stakeholders involved could be seen. However, while the funding of time-limited co-creation projects was a driver for the inclusion of a range of different activities, on the one hand, it was also a challenge for the continuity of some others and the proper consideration of possibilities for scaling beyond the pre-defined duration of the project on the other hand. Other forms seen in the in-depth analyses of Case Studies and Biographies can be distinguished by organisations (i.e. very structured forms with clear rules for participation of internal stakeholders, esp. staff) and networks – be them formalized in any kind of way or very informal without any formalized membership. For the overall sample, the Knowledge Base (SISCODE D2.1) provided additional information on the relation of the co-creation-activities to different entities and looser

forms of collective actors. While the distribution shown in figure 18 is by no means representative due to the sample's explorative character, it still highlights especially two different aspects: first, it shows that different societal sectors (also those providing the basis for the quadruple helix of knowledge production; Carayannis & Campbell 2009), are generally involved in co-creation activities to some extent (see also sections on partnerships) not specified in the standardized responses. In this diagram, civil society, hence the “media-based and culture-based public” (ibid.), is represented by the indicator for NGOs and NPOs (37.7% of the cases were described to be embedded in such) as well as by grassroots initiatives (28.3% of the cases were described to be linked to them). Academia and universities are connected to research organisations (30.4 % of the cases were linked to them) and public administration is represented by political/public/municipal administration (25.4% of the cases were linked) as well as indirectly by subordinate public organisations (17.4%). Second, it indicates and underlines the diversity of approaches as both organisations with formal rules and looser forms like civil society initiatives (i.e. not NGOs or NPOs but grassroots) are involved to some extent. Similar to that, it also becomes clear that different logics linked to these different sectors are also influencing the design and practice of co-creation cases as also found in the in-depth analyses. Hence, e.g. policymaking was just as much an object of co-creation in cases linked to political/public institutions as products in cases linked to business organisations and so forth.

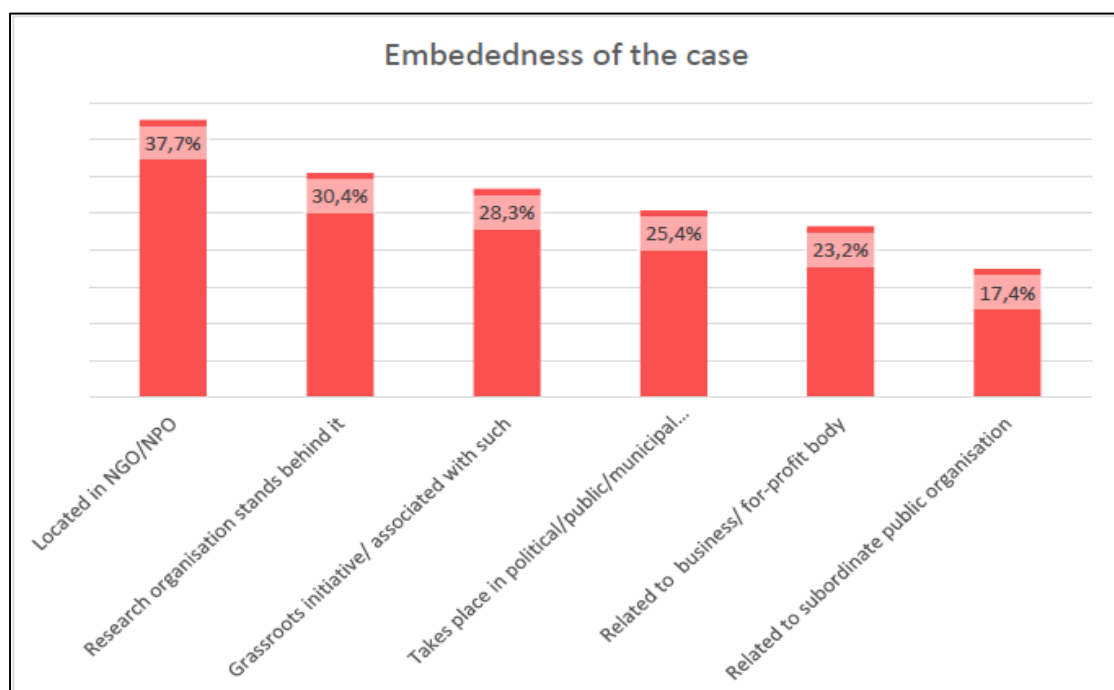


Figure 18 What describes the co-creation case the most? (SISCODE D2.1)

Not at least because of these very different inner frameworks and different logics, the cases examined in the in-depth analysis were also characterized by different governance and management structures. As highlighted in the analyses of Case Studies and Biographies, many cases were featuring rather structured management approaches with clear responsibilities and a clear division of labour. Hence, management boards and advisory boards were seen just as, regular operative staff. Such relatively structured governance approaches might often be linked to formal demands of funding schemes; time-limited projects are financed by. Furthermore, co-creation activities in the sample belonging to formal organisations were also characterized by formal structures of these organisations – of course, this is also true for cases where organisations themselves were the object of co-creation. However, also less structured approaches were found in the cases, for instance, related to relatively loose networks of actors and stakeholders.

For the full sample of co-creation cases in SISCODE's Knowledge Base (SISCODE D2.1), also the information on the number of project partners was collected for each of the cases. The results (see table 16) show that more than 50% of the cases with available information on this number were involving more than five partners in the activities. Hence, the majority of these cases were directly related to some kind of networks (of partners). As the in-depth analyses showed, these cases probably benefitted from these networks and the diverse resources provided or mediated by the different network members. As the majority of cases were enclosing time-limited projects, many of these networks might also be project

consortia not always sustaining after the end of the projects. Furthermore, there were also

Table 16 Number of partner organisations (SISCODE D2.1)

Number of partners	N	% of cases
0	3	2,2
1-5	55	39,9
6-10	24	17,4
More than 10	46	33,3
Impossible to tell	10	7,2
total	138	100

was no support from any external partners as the qualitative analyses in this deliverable already demonstrated. However, it cannot be said with any certainty to what extent these projects may ultimately have also been implemented in a relatively isolated manner.

### *Resources*

As the Knowledge Base (SISCODE D2.1) already showed, financial resources were amongst the most important drivers selected from the pre-defined items for the cases in the full sample (see table 13, section 6.3.2). However, as already highlighted in earlier chapters and sections, there were different other crucial resources both driving and hindering co-creation. In this regard, the Knowledge Base (SISCODE D2.1) collected different structural barriers directly linked to lacking resources (see table 17). As the main barrier, again, financial resources were named – in this context for about 40% of the cases where the lack of those financial resources actually hindered or limited the process. Among other kinds of resources, also lacking competences or missing knowledge and a lack of human resources were named. While this collection is, again, by no means representative due to the explorative character of the sample, it still points out the importance of very different resources needed to successfully conduct co-creation activities. The qualitative comparative analyses of Case Studies and Biographies did also reveal the importance of additional resources, for instance, space (e.g. rooms or even realty) or machines as well as time, which is also linked to access to financial resources (and also others, when provided formally, e.g. through a project-agreement) when time-limited projects end. However, as already discussed before (see 6.3.2, figure 17), resources, in general, were sometimes successfully provided or mediated by partners – be them members of a team or external partners. Hence, the importance of resources does also emphasize the importance of partnerships – also underlined by findings of the comparative in-depth analyses.

Table 17 Structural barriers encountered (SISCODE D2.1)

Structural barriers	N	% of answering cases
Lack of financial resources	40	39,6%
Knowledge / competence deficits	37	36,6%
Missing political support	30	29,7%
Lack of staff (also volunteers)	27	26,7%
Lack of stakeholder engagement	23	22,8%
Lack of institutional access	21	20,8%
Legal restrictions	17	16,8%
Political opposition	4	4,0%
Other, please specify	17	16,8%
N of answering cases	101	

### *External Communication and Dissemination*

As found in the comparative in-depth analysis, the dissemination in all selected cases was generally characterized by the use of a variety of communication channels. However, although dissemination and external communication were not given particular attention in the Knowledge Base (SISCODE D2.1), dissemination was still named as a type of support provided by partners in about 65% of the cases (see figure 17, section 6.3.2). This aspect again highlights the importance of the role of partners to facilitate and distribute co-creation in practice – not only by providing resources but also for supporting awareness for the activities and therefore potentially also for diffusion and outreach to external stakeholders, as also the comparative in-depth analyses showed. Coming back to different strategies for dissemination and external communication in more general terms, especially for in the Case Studies different approaches, channels, and tools were found and especially digital tools and channels were utilized. Overall, external communication was rather structured and strategically oriented in some cases and rather unstructured in others. While this is generally linked to different styles of management and governance (see above), it was also relevant for the success of the outreach to external stakeholders (see also sections on invitation procedures). Communication experts taking up a formal and dedicated role for facilitating not only external but also internal communication in the co-

creation processes, proofed to be successful in some cases. The same applies to the selection of means, where sometimes a rather untargeted utilization of communication tools was leading to lacks of reaching external stakeholders, e.g. for successfully inviting them to co-create. More targeted strategies were, for instance, addressing multipliers among the external stakeholders to create bigger outreach. In addition to external communication and dissemination realized by the management behind the co-creation activities and by partners of the projects, also co-creators were included in this process in some cases. Hence, dissemination also became an object of co-creation itself, especially in cases with a particularly inclusive approach (see 6.3.1).

#### **6.4. Co-Creation Ecosystems: Actors**

In this chapter, the triangulation of the results from the analyses of the Knowledge Base (SISCODE D2.1), the Case Studies, and the Biographies concerning the role of all actors involved in co-creation processes is presented. The description sheds light on the societal challenges that actors face and that motivate them to start a co-creation process.

Furthermore, three different purposes of co-creation are presented. By focussing on different actor constellations, light is shed on the role of these actors in the starting phase of co-creation processes. In addition, this chapter describes different motivations of external stakeholders to participate in co-creation processes and closes with an illustration of lesson learned, drivers, and barriers.

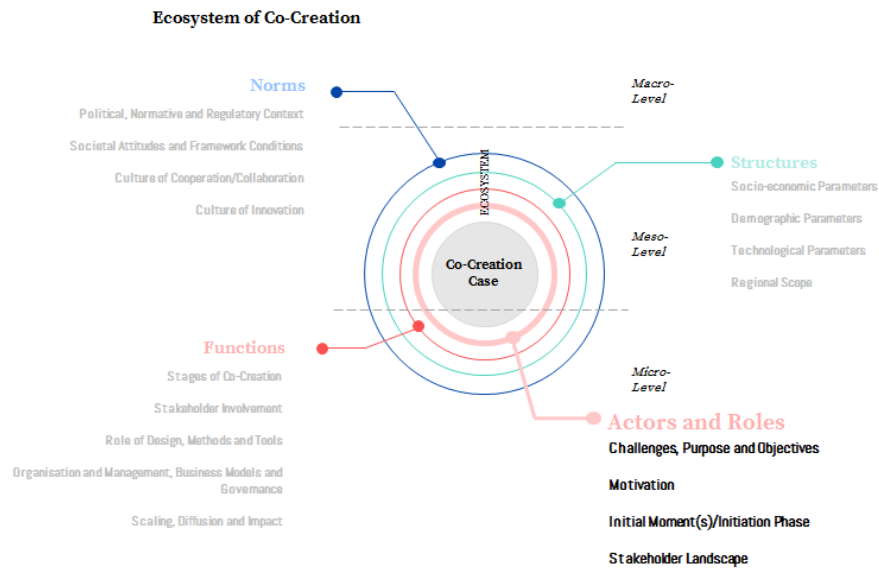


Figure 19 Co-Creation Ecosystems (Source: own; based on Kaletka et al. 2017)

### ***Societal challenges***

The co-creation processes analysed in the Knowledge Base (D2.1), in the Case Studies and in the Biographies address several societal challenges. In each of the three analyses, cases were inductively clustered along the societal challenges. Analysis of all three data sources (i.e. Knowledge Base, Case Studies, and Biographies) revealed two kinds of societal challenges: (1) **Health care and demographic change** and (2) **Environment protection and sustainability**. Around two thirds of the cases collected in the Knowledge Base address problems related to health care and/or demographic change. Every fifth initiative in the Knowledge Base is addressing issues related to “climate action and environment” (SISCODE D2.1, p.8). In addition, in the Case Studies and Biographies ‘environment protection and sustainability’ as well as ‘health care and demographic change’ appear to be frequently addressed topics covered by the initiatives.

About half of the cases in the Knowledge Base were assigned to the topic “Europe in a changing world” (SISCODE D2.1, p.8), according to the corresponding title of a working programme of the funding initiative Horizon 2020 of the European Commission (see figure 20). The subtitle of the working program is *“Inclusive, innovative and reflective societies”*. Hence, the working focus of many initiatives in the sample can probably be traced back to this category, which was provided by a funding organisation and its working programme

(i.e. the European Commission). The aspect of inclusive societies is a main content of some initiatives analysed in the Case Studies and Biographies and these initiatives deal with supporting inclusion of different groups like persons with disabilities, disadvantaged groups in more general terms, and the participation of youngsters in the sense of active citizenship.

Geographical distribution	Societal Challenges	Crosscutting-themes
<ul style="list-style-type: none"> <li>• 19 cases from North EU countries;</li> <li>• 13 from East EU countries;</li> <li>• 30 from the southern EU regions;</li> <li>• 42 from western EU;</li> <li>• 16 cases are related to two or three EU regions;</li> <li>• 5 operate in all over Europe and</li> <li>• 5 other cases have no regional affiliation at all</li> <li>• 8 cases are located in non-EU countries.</li> </ul>	<ul style="list-style-type: none"> <li>• 62,2% of cases (90 out of 138) address health, demographic change and/or wellbeing issues;</li> <li>• Europe in a changing world is a point of reference to 50% (N=69) of the cases;</li> <li>• Also important are the issues of climate action and environment (36 cases) and food security and sustainable resources (29 cases);</li> <li>• Efficient energy, smart transport and secure societies are a rarer subject to SISCODE's cases.</li> </ul>	<ul style="list-style-type: none"> <li>• A very equal share amongst cross-cutting themes is visible</li> <li>• A vast majority of 117 cases stated to address more than one cross-cutting theme;</li> <li>• The three most frequently mentioned cross-cutting themes are: 1) Social Science and Humanities; 2) Gender/ Diversity/ Inclusion/ Intersectionality and 3) Small and medium sized enterprises;</li> <li>• Solely intellectual property reached a share of under 10%.</li> </ul>

Figure 20 Basic characteristics of the sample

Another societal challenge, addressed by Case Studies in the sample is 'economic and regional development'. For example, such co-creation activities design innovative environments for small and medium enterprises (SME) or develop concepts to decrease emigration from geographical districts by making these areas more attractive for citizens again.



### ***Purposes of co-creation***

The analysis of co-creation processes presented in the Innovation Biographies identified three main purposes of co-creation: (1) Testing co-creation as an innovative approach, (2) citizen participation and empowerment, (3) co-creation of products and services.

Some processes aimed to **test co-creation as an innovative approach**. This approach was mainly found in contexts where actors – be them initiators, end-users, or participants – had not much experience with co-creation but where initiators still wanted to experiment with the approach under real-life conditions. Besides the primary results of the specific initiatives, a main target of these initiatives is to be an accelerator for further co-creation projects.

The second purpose identified is **citizen participation and empowerment**. Initiatives utilizing this approach try to answer the question of how to include people who are not used to take actively part in development and decision processes. These people were could be disadvantaged groups general but also youngsters or people with disabilities. In this context, co-creation was a mean to give these groups the chance to gain experience in participating in political or scientific processes in a different way compared to the participation mechanisms of the orthodox institutions (e.g. being a member of a political party or a local government).

The third type of action represents the genuine purpose of co-creation: **Co-creating products and services**. Initiatives following this approach concentrate on the specific use of new technical (e.g. digital) solutions in certain areas. This is illustrated, for instance, by the smart city approach, which aims to test and use new services and technologies in order to develop new traffic concepts and to foster quality of life in urban settings.

### ***Stakeholder landscape***

To operationalize the landscape of stakeholders, the quadruple helix model of knowledge production (Carayannis & Campbell 2009) is providing the basis for analysis. Starting from this model, innovation achieved through co-creation is flourishing when there is participation and interaction of civil society, government, economy, and academia (see chapter 3.4). The analysis of the cases in the Knowledge Base shows that around 40% of the initiatives include actors from all four helix strands, 28% include actors from three strands, 27% were found where two sectors cooperated and only 5% acted as solitary (see figure 21; SISCODE D2.1, p. 24).

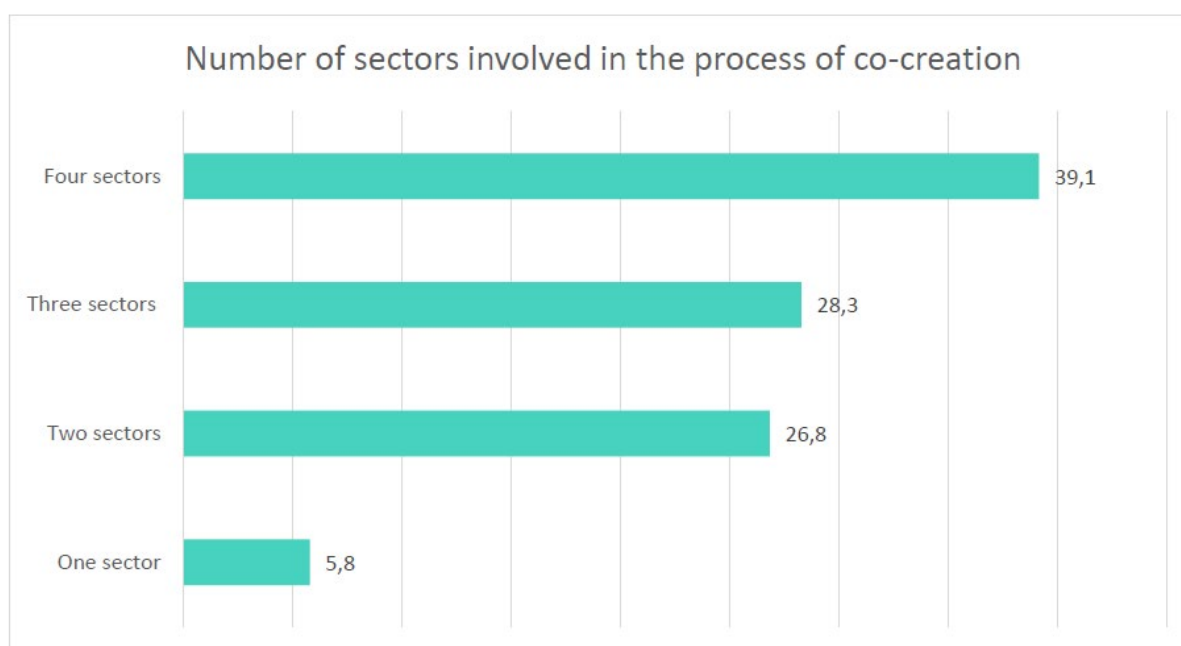


Figure 21 Number of sectors involved in the process of co-creation

The results of the analyses of the Case Studies confirm this distribution. The strand, which is included most in the initiatives collected in the Knowledge Base, is civil society (83%), followed by the public sector (75%), academia (70%) and the private sector (69%) that show nearly an equal proportion (see table 18; SISCODE D2.1, p. 25).

Table 18 Type of sectors involved in the co-creation activity

Sector	N	% of cases
Civil Society	115	83,3%
Public Sector	103	74,6%
Academia	96	69,6%
Private Sector	95	68,8%
total	138	

The data of the Knowledge Base revealed that a vast majority of cases (85%) addresses single citizens or interest groups to become part of the initiative. Initiatives reaching this aim address Non-Government or Non-Profit organizations (46%), grassroots' organisations or activist groups (24%) and makerspaces/fablabs (19%) (see table 19; SISCODE D2.1, p. 23).

Table 19 Stakeholders involved in the co-creation activity

Addressees/ users/ beneficiaries	N	% / cases
Single citizens/ interest groups	117	84,8%
Civil Society Organizations	82	59,4%
Consumers/ Users of a specific product	73	52,9%
Business/ Economy	86	62,3%
Employees and volunteers	75	54,3%
Affected populations (e.g. people with disabilities, refugees etc.), namely	61	44,2%
Others, please specify	41	29,7%
total	138	

However, nearly two thirds of the initiatives stated that they address the for-profit sector as well. Furthermore, the open answers provided in the survey for the initiatives reveal that 30% of the initiatives address academia to be partners in the co-creation processes (SISCODE D2.1, p. 22). A closer look on the initiatives examined in the Case Studies and Biographies confirms that academia plays a significant role. Two main functions of academia were identified: The first one is to be the leader of an initiative and second one is to support the initiatives with scientific analyses and evaluation. The analysis of the Case Studies, furthermore, shows that the identification of the problem to be solved often takes place at a governmental or administrative level.

#### *The role of stakeholders in the starting process*

The Knowledge Base provides an overview of the initiating entities of co-creation processes in the sample. In 45% of the cases, single individuals or groups started the process driven by a variety of motivations. Research programs or previous common actions triggered the process in one third of the initiatives each. One quarter of the initiatives was initiated because of a policy programme. The same proportion is attributable to Non-Government or Non-Profit Organizations. In 16% of the cases a request by stakeholders was the starting point for the initiative (see table 20; SISCODE D2.1, p. 16).

Table 20 Initiating persons or entities

Initiating entity	N	% of cases
A motivated single person / group	62	44,9
A research agenda or need from research	48	34,8
Previous activities / projects	45	32,6
A funding scheme	41	29,7
A policy program	34	24,6
An NGO/NPO	32	23,2
A request by stakeholders (e.g. citizens)	22	15,9
Other, please specify	6	4,3
total	138	

Another part of the Knowledge Base concentrates on the initial motivation to start the co-creation process. Approximately for half of the cases, it was a societal challenge that motivated the stakeholders to start an initiative. Nearly the same proportion of cases was started in relation to a single innovative idea. A local social demand was the starting point for 39% of the initiatives, a new technology for 36% and policy incentives for 22%. A social movement was only for 8% of the initiatives the reason to start a co-creation process (see table 21; SISCODE D2.1, p. 18).

Table 21 First motivation

First motivation	N	% of cases
Societal challenges (e.g. demographic change or climate action)	65	47,1
A single new, innovative idea	64	46,4
A pressing (local) social demand	54	39,1
New technologies of any kind	49	35,5
Policy Incentives	30	21,7
A social movement (e.g. LGBTQ, Social Democracy...)	11	8,0
initial Motivation: Other, please specify	21	15,2
Number of cases	138	

The Case Studies draw a slightly different picture regarding the starting points of the initiatives and the stakeholders involved. Numerous initiatives were started by public institutions or were projects, initiated because of funding programs like the Horizon 2020 program set out by the European Commission. These cases can be described as **top-down co-creation** in respect to their theme because the frames for co-creation (funding, duration, purpose, methods, etc.) are already set by the group of external and internal stakeholders that fund, initiate and promote the initiative. On the other hand, we differentiate **bottom-up co-creation** processes where the group of stakeholders that initiates a process is also congruent with the group of participating stakeholders (see the section on ‘roles’), hence cases where representatives of groups of external stakeholders (i.e. end-users and/or participants) were also internal stakeholders (i.e. staff, project partners, members of the initiatives, etc.). In chapter 5.4, some examples out of the sample of Case Studies were presented that illustrate the starting process and even the motivation of the stakeholders to start a co-creation process. In the case of *ninux.org*, it was a crew of ‘nerds’ meeting in a pub. In the *Mirrorable* case, the parents of a child with a disability started an initiative to find ways to therapy children having this specific disability. In *PIKSL*, persons with disabilities themselves called for programmes to improve their digital competencies and in *Sciencewise – Involve and UK Government BEIS*, the British House of Lords claimed for initiatives to rebuild the trust of citizens in science and politics.

#### *The motivation of stakeholders*

As shown in the last paragraph, there are various motivations for stakeholders to become initiators or participants in a co-creation activity. In this paragraph, we concentrate on the motivation of actors to participate in initiatives. In SISCODE D2.1 (p. 6), it was argued that personal motivation and high interest of like-minded people as well as an innovative environment are the main factors for starting and maintaining co-creation processes. Furthermore, societal challenges and innovative ideas are important motivations to start or join a co-creation process. On the other hand, policy incentives are less important (SISCODE D2.1, p. 17).

Chapter 4.4 of the deliverable at hand identified further motivations of stakeholders to initiative or to join a co-creation initiative as participants. In addition, public institutions and funding organizations should be seen as relevant external stakeholders (or internal, if they are part of the project and its partners) and their precise motivation should be examined too. Their main goal is to tackle societal challenges and to show that

policymakers care about issues that keep citizens busy. However, it is also possible that employees of public institutions trigger the institutions' engagement in co-creation initiatives. The comparison of all the single motivations identified in the Case Studies suggests a distinction between political motives, altruistic or idealistic motives, economic motives, and strategic motives (reputation, networking) of stakeholders.

### *Roles in Co-Creation*

The comparative analysis of Case Studies and Innovation Biographies suggests a distinction of the following roles of actors in co-creation processes:

- The role of initiator
- The role of funder/investor
- The role of facilitator
- The role of participant

These roles are sometimes overlapping. Especially in bottom-up initiatives, such as *ninux.org*, individuals can carry all four roles at the same time, being initiator, funder, facilitator, and participant. In contrast, most top-down initiatives are stronger characterized by a division of labour. Hence, such co-creation activities have a clear division of roles and functions including a funding institution (e.g. connected to an EU Innovation Action), a group of initiators (e.g. public officials in a municipality), facilitators (e.g. a Service Design Agency) and a group of participants (e.g. citizens). However, in between, there is a great variety of clearly divided and overlapping roles. For example, in the case of *Sharing City Umeå*, the funding institution and programme motivated and supported the initiation of the project in the first place. In the case of *Sliperiet / Den Koldioxid snåla Platsen (The Low Carbon Place)*, the initiators (employees of the municipality) have also participated in the co-creation process by actively engaging in the innovation sprint method. A further example is *Lab of Collaborative Youth (LoCY)*, where the group of initiators of the co-creation process are also the main facilitators of the co-design process.

### ***Lessons learned, drivers and barriers***

#### ***The meaning of trust and a level playing field***

The analysis shows that trust between stakeholders in a co-creation process is a main driver for the success of the initiative. In SISCODE D2.1 (p. 33), it was highlighted that trust has to be built already before the operative process starts. A lesson learned that was found in the Case Studies was that trust also emerges during the process of co-creation. In this respect, it is also important that participants are emotionally connected to the project as a prerequisite for developing trust between different groups.

Following these hypotheses, it seems to be clear that an initiative is more successful if it can fall back on existing networks (see also sections on the further development of co-creation processes in chapters 4.3, 5.3, and 7.3), which already gained trust among actors. For regional co-creation initiatives, it could be helpful to identify and engage community champions, because other local stakeholders might develop trust in the initiative based on trust in the community champion's reputation.

Finally, chapter 4.4. revealed that facilitators of co-creation initiatives should keep in mind the importance of trust within the initiatives. A prerequisite to raise and build this trust between the stakeholders is to clarify and be transparent regarding the motivation of all stakeholders that are taking part in the initiative (see paragraph above). To initiate this process is an important task for the facilitators of initiatives.

Furthermore, in SISCODE D2.1 (p. 31), power asymmetries are named as another reason for mismatches in co-creation processes. This was pointed out in several Case Studies and Biographies as well. To interact on a level playing field requires that stakeholders share a common understanding of what they want to reach in the process. In addition, they need a shared terminology everyone understands.

#### ***Developing a common view on the targets of a co-creation process and a common language between stakeholders***

In the Meta-Analysis of the Knowledge Base, it was stated clearly that missing mutual understanding towards crucial concepts and the wording used in the co-creation process is the main reason for mismatches in the process. Around one third of responses from the survey confirmed this statement (SISCODE D2.1, p. 30f.). As a lesson learned, it was pointed out that technical jargons (e.g. from designers) have to be translated into a common and

comprehensible language for participants and users from other fields. Furthermore, the different expectations, goals and values should be clarified between the stakeholders (SISCODE D2.1, p. 32).

The Case Studies pointed out the importance of a common language and a common understanding of targets as well. In one Case Study, it was reported that the participating enterprises had a problem to integrate the user perspective in the development process. Other Case Studies describe issues related to incompatible languages and working styles, for example between designers and civil servants. Different views on targets of co-creation were also found in a Case Study, where youngsters did not find the sense of giving inputs to a research project. In contrast, another Case Study pointed out that researchers were only interested to participate in a co-creation process if it would provide material for their own work.



## 7. Discussion: Benchmark Co-Creation Practices in Europe

The results discussed in this deliverable are one of three important pillars of the SISCODE project: They provide the **empirical basis for better understanding co-creation in RRI in diverse contexts**. The other two pillars are the **theory and Knowledge Base** already produced in WP1 and **10 real-life experimentations in co-creation labs** in WP3. The empirical results at hand come from a comparison of 40 Case Studies and 15 Biographies across Europe, which are separately analysed and then triangulated with D2.1 Knowledge Base. It was the main goal of WP2 to guarantee a systematic interpretation of the research results and to develop a body of knowledge on co-creation which is realistic and actionable in the field of RRI, and which makes a meaningful contribution to the work of actors from both academia and practice – practice, in this case, explicitly including evidence-based policymaking.

Furthermore, the aim of the comparative analysis is to derive several categorisations for co-creation. So, at first, we give a summary and highlight some results of this report, before we, secondly, present the categorisation where different forms of each category are summarised.

### *The significance of the primary ecosystem*

Numerous co-creation projects cover more than one place of action. The European perspective, for example, is especially seen in EU joint projects, whereas single subprojects rather take place in national/regional ecosystems. This causes the differentiation between the places a project covers and the places of action in which co-creation processes are realised, whereby we called the last-mentioned place of action "primary ecosystem". The overall analysis of Case Studies and Biographies also shows that the analysis of local conditions of primary ecosystems drives co-creation processes forward. But on the other hand, there came also difficulties in light. Because scaling-up processes can fail under different contextual ecosystems. Although professionals, experts, and well-developed and tested approaches are in scaling processes.

Another point is the challenge for future co-creation researches. Because the repetition and variation of co-creation approaches in different ecosystems together with a deeper analysis of those factors which make the difference of being considered a failure or success can help to better understand the transversal success factors to co-create. That being said, the examples in this report show that a deep understanding and awareness of the special

conditions of each ecosystem is necessary in order to establish a successful initiative as well as to implement a successful co-creation process. The key is obviously a combination of a deep understanding of the primary ecosystem and the consideration of more generic criteria of co-creation.

On top of this, socio-economic parameters characterise co-creation ecosystems by being the (problematic) condition under which the project has to create solutions and needs to be considered - when projects do not address socio-economic challenges, but rather handle the fact of difficulties to get relevant stakeholders to the co-creation process because they are excluded from the school system and labour market (see *Será que o mar vai engolir o Bairro?*) - as well as the challenge itself, e.g. when the project has to handle with socio-economic challenges like an aging society or the restructuring of economic structures (e.g. *Ilona - Robot Brings Joy in Elderly Care*). Having these two aspects in mind, it can be said that there are two main categories of socio-economic parameters that characterise co-creation - the object/challenge of the co-creation project and the conditions under which co-creation processes are done.

#### *A true quadruple helix of co-creation actors*

The overall analysis of Case Studies and Biographies revealed that many co-creation initiatives in the sample strive to continue or scale their activity – through follow-ups, scaling it by reaching new target groups, or working for systemic change in a target area. The analysis showed that systemic change realized by cases in the sample in general and especially in the short term benefitted from the support of quadruple helix partnerships (see chap. 3.4).

There are numerous reasons why stakeholders are asked to participate in the co-creation projects: sometimes they are included to co-create, in all or selective stages, sometimes they are needed to evaluate the suitability of an outcome, sometimes they are needed to identify a challenge professionals are realizing a solution for and sometimes they are invited to contribute new perspectives on a pre-defined theme or output. The analysis shows that the selection of stakeholders is often starting from the perception of their relevance and suitability by partners and due to their specific interest in a co-creation activity. Some initiatives select and invite stakeholders in a way that allows to achieve a certain demographic representativeness for the area. Others conduct a very open selection of stakeholders, and in some cases, even spontaneous participation of stakeholders is made possible and enabled by an ‘open door policy’ of public innovation hubs and labs.

While the observations made above mostly strive to include citizens, another important aspect of actor constellation is the participation of societal sectors. One of the most significant results of this report is that all four sectors of the quadruple helix (government, academia, industry, civil society) of knowledge production were identified as co-creation partners, with a similar degree of representation in the initiatives. With the civil society involved in 83.3%, the public sector in 74.6%, academia in 70 and the private sector in 69% of the initiatives analysed, all four sectors' involvement is both high and relatively close to one another. This means that co-creation is not a trademark of a specific sector, but all sectors are able and willing to engage in such processes. Equally remarkable is the fact that the largest share of cases in the full sample (39%) was including all four sectors, with 28% including three of them.

These are important empirical results for a variety of reasons. For example, while the Meta-Analysis pointed out that “divergent conceptions towards crucial concepts”, incompatible “wording and language”, “power-asymmetries” and “ideological mismatches” (SISCODE D2.1) were factors severely impeding the success of co-creation initiatives, initiatives with three or four societal sectors involved in fact seem to regularly find ways to deal with these challenges.

Another reason why the actor constellations identified are remarkable is the contrast to other recent empirical findings: The *SI-DRIVE* project analysed social innovation initiatives, which are similar, but not identical with co-creation initiatives as far as both their objectives and methodology are concerned. The involvement of the quadruple helix model was also analysed in *SI-DRIVE*, with the result that while all four societal sectors are participating in social innovation, academia was severely lagging behind (see Anderson, Domanski & Howaldt 2018). This unexplored potential of academia in social innovation seems to be much more integrated into co-creation initiatives – of course, one of the main reasons for this difference is that a focus on RRI leads to a positive bias towards academia involvement. The cases analysed provide interesting insights into the role academia is able and willing to play in co-creation and also about its possible motivation. While the role of academia differs among the cases, it fulfils two main functions: In some cases, academia is the driving force and facilitator of initiatives; in other cases they contribute analyses or evaluation. Academia embodies therefore the power to implement co-creation processes successfully, whereby it is still open for advice from other helix strands. It has thus not the full power to co-create - it is more powerful in co-creation when cooperating with other helix actors. And while one motivation of researchers is certainly to gain new knowledge or

receive third-party funding, the strong involvement can also be understood as academia learning to better fulfil its third mission of generating knowledge outside academic environments to the benefit of the social, cultural, and economic development. This corresponds with observations coming from initiatives of the co-creation sample stating that one reason for the success of an initiative was academia being open for advice from other helix strands and actively participated in the definition of common targets and knowledge to be developed during the co-creation process.

### *Roles of stakeholders*

Actors found in the Case Studies and Biographies that had a 'stake', hence an interest, in the respective co-creation initiatives and processes were looked at as stakeholders. Among these stakeholders, we further distinguished between external (e.g. participants, end-users) and internal stakeholders (e.g. team members, project partners, initiators) (see chapter 3.4) for analytical reasons. However, beyond this dichotomy, different stakeholders were also found to have different roles. Hence, we suggested a categorization of different roles:

- The role of an initiator
- The role of a funder/investor
- The role of a facilitator
- The role of a participant

First, there are initiators who are actors that feel responsible or are made responsible for co-creation processes in terms of their competences and skills. They are involved in starting, funding, and governing the co-creation process and drive co-creation forward by identifying, involving, and maintaining the engagement of participating stakeholders over a long period of time. Secondly, funders/investors are also actors who fund the co-creation project. Thereby funding institutions as well as stakeholder groups of initiators (e.g. public officials in a municipality) can be the main funders and investors. Thirdly, there are facilitators. They can be professionals but also experts through learning-by-doing. Generally, they coordinate communication, enhance trust (neutral facilitator) and cater therefore for successfully co-creation processes. Fourth, participants who are the main knowledge-providers and co-creators. Of course, some of them are also end-users of the co-created solution and hence part of the target group.

In our analysis, we have found that these roles are sometimes overlapping. Especially in bottom-up initiatives, individuals were found to even have all of these different roles at the

same time. Different to that, initiatives initiated top-down were rather found to be characterized by a stronger division of labour with clearly separated responsibilities. This aspect might be related to the availability of resources - especially financial resources but also human resources, hence personnel to take up all of these roles separately. However, the analysis also revealed that there is a variety of different approaches in practice where some roles are clearly divided from each other and where others are combined or taken up by the same individual (i.e. person) or collective actor (e.g. organisation). Future research on co-creation could address the question if there are specific settings where co-creation benefits from either a strong division of labour or a 'combination' of labour, hence an approach, where single actors have more than one role.

### *Motivation of stakeholders*

From the comparative analysis of Case Studies and Biographies, we can differentiate between four forms of motivations of stakeholders in co-creation processes. Initiators often work toward a societal challenge, whereas the funders' motivation is to contribute to the co-creation success to find solutions for important issues on the political agenda as well as to show that policy tries to find innovative co-creation solutions. This last-mentioned motivation can be thus summarised as *political motives* to co-create. But there are also *altruistic motives* that are fund by local facilitators who started, for example, the co-creation project to prevent natural problems. *Economic dimensions* can also be identified as motivations to participate in co-creation, e.g. when participants get money for it or when they are winners of a contest of ideas. Another motivation is the *strategical* one that bases on reputation and networking to spread co-creative ideas. Hence, we can distinguish between political motives, altruistic or idealistic motives, economic reasons, and strategical motivation of stakeholders as participants in co-creation processes.

Overall, concerning the general motivation of co-creation processes, co-creation is often a response to various societal challenges, whereby two kinds have been identified. On the one hand, *health care/demographic change* and, on the other hand, *environment protection/sustainability*.

### *Functional and normative interplay for a collaborative culture*

The political and regulatory frameworks are closely connected with innovation policies and culture of innovation on the organisational level in the respective context. To examine a '**culture of innovation**', we distinguish three categories of innovation systems and culture

for the examined Biographies. These categories comprise innovation actors (e.g. funders, initiators) and actions (e.g. policies, funding schemes), on all political levels (EU, national, regional, municipal). For reasons of simplification, at this point, we do not differentiate further between innovation systems and innovation culture as well as between innovation policies on different policy levels. Rather, we try to grasp the notion 'innovation' in each case.

*Co-creation in a mature innovation system and culture:* Several of the cases describe co-creation initiatives that are derived from and are embedded in distinct innovation systems that also consider RRI in innovation strategies and funding schemes.

*Co-creation in an emerging innovation system and culture:* Several of the cases describe co-creation processes that have been started under preconditions of a rather emerging innovation system and culture which means that support structures for innovation actors and actions are not yet distinctive, especially with regard to RRI.

*Co-creation in an early-stage innovation system and culture:* Some of the cases can be characterised as early-stage innovation systems and cultures where innovation actors and actions are not yet in place and bottom-up co-creation initiatives do not receive support from an advanced innovation system in the field.

Besides these categories of innovation systems and culture, there are also cultures of collaboration. These are one the one hand in the initiatives' primary ecosystem in general and on the other hand in government and administration in particular. In some cases, government or administration bodies are active parts of initiatives. This observation can be attributed to the functional dimension of the ecosystem as stakeholder involvement has become a local or regional routine, with appropriate methods and tools in place and supported by positive experiences made in the past. In some cases, it is also an element of the normative dimension, either when the regulatory context foresees comprehensive participation of different stakeholders for certain development projects, or when a culture of collaboration has emerged over time which is relatively independent of current actors and networks and which has been deeply embedded in social routines of a district, a city or a region.

Furthermore, collaborative approaches need to include the citizens' view in political decisions. But concerning policy-makers and public servants, the need for collaboration is also stated in order to solve complex problems. Thereby, with resources, competences

methods, tools, and willing stakeholders on board, positive experiences with co-creation were publicly made what then influence the culture of collaboration.

But while progressive government and administration bodies promote participation and collaboration and serve as important drivers for the initiatives, the orthodox structure and culture of administrations often lack mechanisms to incorporate citizens' views.

Bureaucracy and the resistance of civil servants against new approaches of participation and collaboration were branded as barriers in several Case Studies. Finding solutions here challenges civil society, governments and administrations, and academia to identify an appropriate starting point for making experiences in co-creation – methodologically equipped, and by tackling a sufficiently complex challenge which requires multi-perspectivity to tackle. Such experiences made, especially by government and administration bodies, can lead to a cultural change in the participating organizations, establish new networks and routines, and sustain co-creation.

Reflecting the cultural, regulatory, and normative conditions structuring an ecosystem should be part of projects and initiatives which aim to implement innovations and employ co-creation. This specifically counts for those initiatives which try to scale up and implement their solution in a new ecosystemic setting. For them, a solid understanding of the culture of collaboration should be a part of their risk management.

#### *Process design and co-creation tools*

Process design is as diverse as the cases themselves. Most processes described in the cases are rather innovation and development processes that are to a certain extent characterized by co-creation, either as a whole or only in defined phases. Most cases are featuring an adapted design cycle approach, with differences to the co-design cycle defined for SISCODE. There are also cases which do not follow an explicit cycle and which are instead limited to single phases like a collective public brainstorming / ideation. In more complex approaches, iteration is happening between and across different stages. Sometimes the whole cycle is iterated, in other cases, there is iteration between single phases and sometimes within a single phase. Hence, the practice of iteration is highlighting the creative and non-linear pathways co-creation can take. On the other hand, the analysis showed that time plays a crucial role for co-creation in the sample and is often a relatively scarce resource. Many cases are defined as time-limited projects, others are struggling to continue or institutionalize their project, organisation, or network. When projects are time-limited, so are often the single co-creation phases or the whole co-creation process.

Consequently, decisions for iteration are ambivalent, iteration has to be affordable. One approach for further research should be to investigate the ownership of iteration: How are decisions to iterate made in co-creation initiatives? Who participates in the decision? What are the reasons for avoiding (time-consuming, resource-intensive) iteration? And how can iteration, which will be considered tedious and uselessly repetitive by some, be decided, communicated, and implemented in a way which allows keeping all groups on board?

The practice of co-creation is not only enabled by design thinking techniques and facilitation concepts. Appropriate and target-group oriented communication in the co-creation processes of the sample seems to be a crucial success factor. Generally, the cases reveal that communication needs to be comprehensible. This aspect applies to different levels: choosing the right (native) language, using a comprehensible style of language, and leaving enough space for communication when there is a need, for instance, due to conflicts between different participants. In other words, inappropriate communication and language can have exclusive effects and restrict participation.

What is also striking across all cases is the increasing relevance of digital tools, including both hardware and software. Hardware as supportive tools enabling co-creative practices (e.g. smartphones, cameras, 3D-printers) and the object or output of co-creation (e.g. a service robot in the case *Ilona - Robot Brings Joy in Elderly Care*). Sometimes, the hardware is also both the same time: the object of co-creation and a supportive tool for it. The same can be true for software, for instance in the case Intelligent Maps, where an app was co-created and, at the same time, is also the basis for co-creation of a map. The rise of digital tools, and also the accelerated digitalisation in times of the corona pandemic, leads to the question of how face-to-face and distant settings can be combined in co-creation processes. This cannot be answered on the empirical basis of this analysis and requires further investigation. An important factor, again, is the hidden exclusion mechanisms of certain participant groups without appropriate access to competence to participate in such elaborated co-creation settings.

### *Objectives vs resources*

The cases try to achieve impact on different scales, in a sense that their desired outreach and impact is quite diverse. On the one hand, there are project designs that primarily seek to develop solutions for concrete identified problems, such as new services, new infrastructures, strategies or policies, new business models, or tangible artefacts. On the



other hand, there are also project designs that aim at a more generic level and want to achieve broader social impact.

Both cases analysed from the Biographies and Case Studies sample were foremost characterized by their **limitation in time**. A general interest in funding co-creation across different themes and contexts with participants from different stakeholder groups involved can be observed. However, while funding of time-limited co-creation projects was a driver for the conduction of a great amount of activities, on the one hand, it was also a challenge for some activities to continue or scale the process and apply the lessons learned on a broader scale. In general, it was the ambition of many co-creation activities in the sample to achieve systemic change. This was translated in the sense of changing practices, norms, or values in a larger context, be it in organisations, regions, or internationally. However, only a few consider themselves to be successful in this respect, so a systemic change was very scarce, or the initiatives did not have the resources or the time to assess what they have achieved on a larger scale. Change is more often realized in smaller, for example, urban contexts, when communities are taking up co-creative practices or when practices in an organisation are being influenced – for instance in public administration. What can be said on the basis of this analysis is that the time limits of third-party funded projects and initiatives are a main obstacle to achieving and/or verifying systemic change and sustaining the results.

Apart from time, co-creators themselves are considered the most important resource enabling co-creation, which is not a complete surprise. Moreover, **human resources** are generally crucial in order to realize co-creation – be it for managerial purposes, to facilitate co-creation in progress, as experts, or as members of important networks. Directly linked to human resources is the significance of networks and communities the cases depend upon. Another crucial resource for most cases was **knowledge**. This was especially true for activities where complex problems were addressed or where complex technologies were used. Since most cases were conducting their co-creation activities in person, physical resources like appropriately equipped rooms and facilitation devices are also described as important resources. These seemingly simple factors in fact allow for professional facilitation of co-creation processes and should not be underestimated – just like the professional competences required throughout the different phases. When it comes to resources, of course, we should not forget the resources that usually come first into mind: **financial resources**. For co-creation cases in our sample, they were usually scarce. Hence, co-creation initiatives were mostly depending on external funding, which usually led to the

limitations in time mentioned above. Funding in many cases was provided by funding schemes of the European Union and by other public bodies. However, this observation does not necessarily reflect the co-creation landscape in practice and could be a result of the explorative approach of the sample.

### *Inclusiveness and diversity in co-creation*

Several initiatives state that they aim for diversity and inclusiveness in their co-creation processes. While tackling specific and often complex topics in education, healthcare, or urban development, diversity and inclusiveness emerge as secondary challenges.

Generally, a perspective on all cases analysed in the co-creation Case Studies and Biographies suggests a distinction between **different categories of stakeholder inclusiveness**. The following classification was suggested (see chapter 6.3): In inclusive co-creation activities, stakeholders are co-creating across all development phases and sometimes also beyond on the administrative/managerial level. Such inclusiveness can basically apply to the full diversity of social groups in the sense of Responsible Research and Innovation. One case exemplifying this category was, for instance, focussing on an approach open and inclusive to persons with disabilities. Punctual co-creation activities show external stakeholders co-creating in selective development phases, while in consultative co-creation activities external stakeholders are not invited to co-create. The most interesting and demanding category is certainly the inclusive one, where external stakeholders are integrated as participants in most or all phases of co-creation. In the sample, such cases tend to be rather holistic in a sense that they are aimed at establishing or testing different (i.e. co-creative) practices of creating outputs and outcomes in a defined context (e.g. an organization, a domain or a geographical context).

The goal of diversity is frequently mentioned in the Case Studies and Biographies, but in practice, it is seldom going beyond the involvement of actors from different sectors or societal domains. At the same time, there are cases in the sample that were explicitly aiming at marginalized societal groups in a sense of social inclusion, where society is changing towards achieving full participation of all societal groups. In this respect, for instance, persons with disabilities or marginalized youth were aimed at and part of the co-creators on purpose beyond their function for enhancing the outputs of co-creation.

The empirical data does not allow to analyse the reasons for co-creating in an inclusive and diverse way. An initial hypothesis for future research is that representation and expertise

are two driving factors: Representation is a reason explicitly mentioned by initiatives. The local society with its diverse stakeholder and interest groups should be part of the co-creation process to make sure different voices are being heard. Secondly, expertise can also be an important reason, since people from marginalized groups are experts on their own behalf. For example, people with disabilities are key stakeholders in an initiative of the sample because they have proven to be experts in reducing complexity and therefore can be excellent coaches. This corresponds with the question of who provides what type of expertise to a co-creation process. Furthermore, inclusive approaches not only need to consider how to be open as much as possible but also how to be open for necessary participants rather than open for participants with no stake in the problem addressed – hence ‘wrong’ participants. In practice, it might be difficult to be open and inclusive to all stakeholders while being exclusive to actors that have no stake. In addition, it might be difficult to reach ‘necessary’ participants (e.g. with necessary competences) when being as inclusive as possible, as findings on mismatches suggest. When experts do not accept to co-create in an inclusive environment together with laypersons, for instance, inclusiveness, as well as openness, might contradict the success of co-creation. Hence, it is important to find the right strategies to address such mismatches in order to make open and inclusive approaches successful. Future research should, therefore, take into account the question of how to achieve openness, inclusiveness, and diversity while, at the same time, achieving participation of necessary functionaries (e.g. experts, knowledge providers, decision-makers) critical to openness and inclusiveness.

We hope that the results presented in this report will give new impulses for further research on co-creation processes and their contextual specificity. An in-depth understanding of co-creation ecosystems is essential for the development of innovation processes of all kinds, in theory, and practice and for its contribution to Public Engagement and Responsible Research and Innovation. SISCODE has developed a set of instruments to transfer theoretical and empirical results into practice including an operative playground for ten small-scale experiments in European co-creation labs as well as 12 policy-maker workshops and an online policy learning hub.

The main objective of the upcoming work package 5 of SISCODE will be to triangulate the results described in this report with the data collected from the real-life experimentation - done both on a micro-level (T5.2) and a macro level (T5.1) – to then reflect on the model of co-creation ecosystems and its different modes and interactions entailed (T5.3).

*Learnings from the research process: The application of the ecosystem model*

The analysis presented in the deliverable at hand was framed by an analytical grid on the basis of an ecosystem model (see chapter 3.4). This model was adapted from a model developed for research on social innovation (Kaletka et al. 2017), based on a model for the production of media (Weischenberg 1990). This was done in order to identify context factors related to norms, structures, actors, and functions. In the research process, we have learned, that the ecosystem model was helpful to define objects of observation on different levels related to the contexts. However, at the same time, we have also learned that the application of the model in research on co-creation does also ask for further differentiation and adjustments. As Kaletka et al. stated: “The four layers of the model can be considered separately, which helps to structure and analyze similar intervening factors in groups. In a following step, these factors can also be analyzed more deeply by elaborating on their interrelations and thereby visualizing the ecosystemic complexity as a whole.” (Kaletka et al. 2017) We also found that the contexts defined for the model present a good starting point, but they need to be analysed in-depth based on additional specifications that are appropriate for the object of analysis – here: co-creation. For our research, we decided to further differentiate the contexts by adding elements forming the basis for the analytical units as explained in chapter 3.4. However, inductively gained findings made it necessary to differentiate even further. Hence, we had to distinguish, for instance, between tools and methods and different stakeholder-groups. Based on these learnings, we suggest to define additional, subordinate, context factors and additional units of analysis when applying the ecosystem model for research on co-creation and beyond. For SISCODE’s work package 5, the partners agreed to put special emphasis on different models of interaction and dimensions of Responsible Research and Innovation (RRI) in the triangulation of results from the report at hand and results from the real-life experimentation. These elements will also be a starting point for further differentiation and adaption of the ecosystem model based on the requirements of the research focus.

## 8. Categories and Open Questions for Further Research

The comparative analysis of Case Studies and Biographies as well as the triangulation with results from the Meta-Analysis presented in chapters 4, 5, and 6, led to various findings discussed in the last chapter. Among these findings, different categorisations were highlighted. These categorisations can be understood as a first approach towards classifications and typologies. However, due to the analytical approach (see chapter 3), these first categorisation do not represent ideal types in the sense of Max Weber (Weber 1980). Much more, they are not rooted in single cases but were elaborated based on findings from the comparative analysis of information gathered across all cases in the course of the qualitative content analysis (see chapter 3.5). The categorisations were found in the analysis of all four contexts distinguished based on the analytical grid provided by the ecosystem model (see chapter 3.4), hence the contexts of structures, norms, actors and roles, and functions. In table 22, we provide a condensed overview of these six categorisations and their respective categories. It has to be noted that these categorisations rather provide an overview of categories identified via analysis in the non-representative, explorative sample of the SISCODE Knowledge Base and the qualitative data from the Case Studies and Biographies. Hence, these categorisations can be seen as possible starting points for further research. In the course of such research, these categories could be added, verified, or falsified. In result, typologies could be elaborated based on the analysis of single cases in contrast to the comparative analysis conducted in the deliverable at hand.

Table 22 Categorisations of elements of co-creation in different contexts

Context according to the ecosystem model	Categorisation	Categories
Structures	Socio-economic parameters	<ul style="list-style-type: none"> <li>Object/challenge of the co-creation project</li> <li>Conditions under which co-creation processes are done</li> </ul>
Norms	Culture of innovation	<ul style="list-style-type: none"> <li>Co-creation in a mature innovation system and culture</li> <li>Co-creation in an emerging innovation system and culture</li> <li>Co-creation in an early-stage innovation system and culture</li> </ul>
Actors and Roles	Roles of actors	<ul style="list-style-type: none"> <li>Initiator</li> <li>Funder/investor</li> <li>Facilitator</li> <li>Participant</li> </ul>

	Motivation of actors	<ul style="list-style-type: none"> <li>• Political motives</li> <li>• Altruistic or idealistic motives</li> <li>• Economic reasons</li> <li>• Strategic motivation</li> </ul>
	Societal challenges	<ul style="list-style-type: none"> <li>• Health care/demographic change</li> <li>• Environment protection/sustainability</li> </ul>
Functions	Stakeholder inclusiveness	<ul style="list-style-type: none"> <li>• Inclusive co-creation activities</li> <li>• Punctual co-creation activities</li> <li>• Consultative co-creation activities</li> </ul>

In addition to the categorisations, the discussion (chapter 7) also presented some open questions, which might be addressed by further research. These open questions are summarized and concretised in the following paragraphs. However, it has to be noted that these open questions represent single spotlights rather than the essence of this report. However, we still wanted to present these open questions as they might be taken up by other researchers.

Future research on co-creation could address the question if there are specific settings where co-creation benefits from either a strong division of labour or a ‘combination’ of labour, hence an approach, where single actors have more than one role in a co-creation initiative or process. A possible research question would be:

*Under which conditions do co-creation initiatives benefit from a clear division of labour and under which conditions is such a division becoming a barrier?*

Most of the initiatives we analysed were funded projects that followed certain pathways set by policy or funding programmes. Thus, the problem to be addressed has been identified by the funding body. Research on co-creation should suggest ways to support real bottom up co-creation processes even in settings where themes are set bottom-up:

*How can co-creation initiatives, that were not initiated by a funding programme, be supported by financial means and other measures?*

Co-creation processes, in general, were found to be differently inclusive. Future research could take into account how to achieve openness, inclusiveness, and diversity while, at the same time, achieving participation of necessary functionaries (e.g. experts, knowledge providers, decision-makers) critical to openness and inclusiveness. A possible research question in this respect might be:

*How can co-creation be inclusive and attractive at the same time for all stakeholders needed to participate for successful and sustainable solutions?*

The rise of digital tools, and the accelerated digitalisation in times of the corona pandemic, lead to the question of how face-to-face and distant settings can be combined in co-creation processes. An important factor in this respect is the hidden exclusion mechanisms of certain participant groups without appropriate access to competence to participate in such elaborated co-creation settings. Possible research questions could be:

*How can face-to-face and distant settings be combined in co-creation processes in a supportive way?*

*How can co-creation in the virtual space be inclusive for participant groups without appropriate access to competence to participate?*

Future results from SISCODE's real-life experimentation might provide information for first answers to these questions, as experimentation already had to take place de-centralized and in virtual space during the corona pandemic.

Last but not least, based on the lessons learned from the application of the ecosystem model discussed in chapter 7, we suggest for further research to conduct a clear delimitation of the research object, followed by an adaption of the ecosystem model according to the respective focus. The adaption of the model and the further differentiation and operationalisation for the qualitative content analysis underlined the potential of the model to guide research on co-creation. At the same time, this further differentiation proved to be successful in providing appropriate units of analysis for understanding co-creation in practice. As already indicated before, SISCODE will further differentiate the contexts of the ecosystem model for research in work package 5, where results from the analysis of real-life experiments will be triangulated with results from the report at hand.

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## Annex:

### List of SISCODE Co-Creation Cases (Knowledge Base, Co-Creation Case Studies and Innovation Biographies)

All cases from the first explorative database are analysed in D2.1 Knowledge Base and presented in the list of this annex. Cases that have been chosen for an in-depth Case Study are marked with \* in the list. Cases that have been chosen for an Innovation Biography are marked with \*\*. All Co-Creation Case Studies and Co-Creation Innovation Biographies are compiled in D2.2 Case Studies and Innovation Biographies Report.

Table 23 List of SISCODE Co-Creation Cases

Case	Short description	Scope/Location
?Play4? campaigns: Breaking the social exclusion walls!	The aim is to limit social exclusion and enhance interaction between the community and institutionalized seniors and chronic disease outpatients, transferring nursing homes and patients associations into open structures and raising awareness of the cultural stigma through gamification.	City
AD-Autonomy: Development of a Training Program for Enhancing the Autonomy of Persons with Alzheimer	It is an EU-based project, run by Universities and Patients Associations, with the main objective of increasing the competences (attitudes, skills, knowledge) of Persons with Alzheimer, Families and Caregivers, about how to improve their Quality of Life through Autonomy through an innovative training program.	EU
Apulian ICT Living Lab**	Apulian ICT Living Lab is an initiative promoted by the Regional Government of the Apulia Region in Italy, and in particular by the Economic Development, Employment and Innovation Department – Industrial Research and Innovation Service, and implemented by InnovaPuglia, an in-house company of the Apulia Region - Technical Support Division, supporting the regional strategic planning in terms of digital innovation.	Region
Bath: Hacked	Bath: Hacked is a grassroots initiative that brings together Bath (UK) municipality and local community to tackle local problems with the use of open data and smart thinking.	City
BeeWeb Platform	The idea of BeeWeb platform lies in ICT support to beekeeping with the goal to improve average annual yield per beehive,	Nation State

\* This case has been chosen for an in-depth Case Study (see D2.2 Case Studies and Innovation Biographies Report)

\*\* This case has been chosen for an Innovation Biography (see D2.2 Case Studies and Innovation Biographies Report)

	reduce migratory beekeeping cost and improve honey pasture utilisation.	
Benchmarking for data-limited fishery systems	Managers, scientists, and fishery representatives were invited to interact within a facilitated environment with the aim of improving understanding of main problems in the system and of negotiating solutions meaningful to all participants.	Nation State
Bioteket	Bioteket is an ecological design and cultural house in Copenhagen, located as part of Osramhuset and established in spring 2016. It's an incubator for urban ecological solutions and start-ups, an educatorium and experimentation space.	City
Borgernes Hus (The Citizen House)*	An innovative collaboration between the city of Odense and two design agencies has created a solid concept for the development of the city's most pivotal house, creating a shared urban space for citizens and businesses alike.	City
Børn Bygger Byen (Børn Bygger Blokken)	'Børn Bygger Byen' aimed at examining the potentials of involving children and young people in the development of housing social areas and urban renewal projects through maker methods and at co-creating better renovating and building solutions in social housing areas.	Neighbourhood
Boxing Future Health*	Boxing Future Health consists of four physical scenarios that take the form of four cylinders which can be entered to feel, smell, and listen to alternative futures for healthcare anno 2050.	Region
Brighton and Hove Digital Health Living Lab	The Digital Health Living Lab is a unique testbed. Home to 50 families it offers an arena for testing and developing prototypes or mature products and services that have the potential to improve welfare services, reduce financial pressure to public sector services and enable healthy living as a whole.	City
CARE(E)RS RALLY / AUTONOM'LAB	The case aims at improving the quality of home services delivered to elderly or disabled people in focusing on improving attractively, professionalisation, recognition of Home helpers jobs.	Region
Centre for Social Innovation (CSI) Toronto*	Members of the Centre for Social Innovation work across sectors to create a better world. The Centre for Social Innovation accelerates their success and amplifies their impact through the power of co-working, community and collaboration.	City

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CHEST Collective Enhanced Environment for Social Tasks	In the EU funded project, citizens, social innovators, scientists, technology experts, and other stakeholders collaborated in the participatory development of innovative solutions to societal challenges enabled by digital technologies.	EU
Ci-Tiques appli	A collaborative research program by researcher at INRA, aiming at bringing together researchers and citizens, end-users, in a participatory program that helped develop an application where users can feedback their data on insect bites, localisation, and get information about health issues.	Nation State
Co:Create Rotherham Council Young Person's Drug and Alcohol Service	The work with Rotherham council aimed to firstly engage with young people in the town more through their involvement in the town's city strategy. They were inspired by Leeds city council's approach to young people. The aim is to treat young people as a whole and more holistically in the future.	City
Coach Assistant via Projected and Tangible Interface	It is an EU-based project funded by H2020, coordinated by the Aristotle University of Thessaloniki and run by 15 partners across Europe (academia and companies). It aims to co-create an ICT system for assisting and supporting older adults in their everyday life at home.	EU
Community Water Management for a Liveable London (CAMELLIA)	The case brings together environmental, engineering, urban planning and socio-economic experts with industry, policymakers, and citizens to co-develop a systems approach to urban water management. It provides integrated solutions to enable required housing growth whilst sustainably managing water.	Neighbourhood
Connect Innovation Bai project - GAIA's Living Labs	It is a trans-regional project run by GAIA's Living Labs which focuses on the deployment and development in the Spanish Basque Country and Nouvelle Aquitaine in France. The objective of the case was to bring outdoor sports technologies to the public to test them and validate them.	Region
Cube Call: Aangenaam!	It is a design challenge organised by Cube design museum in Kerkrade (NL), carried out by a multidisciplinary student team in co-creation with museum visitors and end-users. The case aims to find ways to improve contact between Dutch people and migrants and to lower the threshold that makes establishing contact difficult, by using design methods and technologies.	City
DDMP (Distributed Design Market Platform)	It is a four-year Creative Europe project and acts as an exchange and networking hub for the European Maker Movement. It	EU

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\*\* This case has been chosen for an Innovation Biography (see D2.2 Case Studies and Innovation Biographies Report)

	consists of both online and offline activities such as events, resources, workshops, fairs and boot camps that promote and advocate for emerging creative talent in Europe.	
DeeBee Italia	The case aims to explore a DIY project that allows real-time access to continuous glucose monitoring (CGM) data via a personal website, smartwatch viewers, or apps and widgets available for smartphones.	Nation State
Designs role in Satellite Applications and Transportation Systems Catapults	Innovate UK has established 7 Catapult Centres which look to close the gap between universities and industry. This project explored the use of the principles of design within two of these catapults: the Satellite Applications Catapult and the Transport Applications Catapult.	Nation State
Digital Farm in Serbia	The Digital Farm will allow farmers from Serbia to learn more about the opportunities provided by digitization and new technologies in every segment of crop production. The Digital Farm aims to support the digital transformation of agriculture in Serbia, the region and in Europe.	Region
DS-Leisure: Training Program for Improving Quality of Life of Persons with Down Syndrome through Inclusive Leisure	It is an EU-based project run by two Universities and four Persons with Down Syndrome Associations and it focuses on the development of an innovative training program, based on inclusive leisure activities, so as to improve the quality of life of persons with Down Syndrome and their families and caregivers in Europe.	EU
Ecomuseo Casilino ad Duas Lauros (Rome)*	It is a project based in the eastern suburbs of Rome. Through the knowledge and recognition of the local cultural heritage, the project aims to involve the communities to build a new governance of the territory, based on innovative models of sustainable development and urban regeneration.	Urban district
E-FABRIK**	This project brings together differently-abled people and young adults in NEET (neither in employment, education or training) to design and build prototypes which respond to the everyday need of the differently-abled people, using digital fabrication tools in a collaborative design process.	Region
Engineering Comes Home**	The Engineering Comes Home project applied the principles of co-design to the problem of reducing water, energy and food resource impacts in a social housing community in London.	Neighbourhood
Europeana Culture Jam	During one-day intense Culture Jam in Krakow, participants shared ideas and designs, inspired each other and tested new	City

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	ways of integrating digital heritage into new concepts. With the prototype-oriented event, people saw intermediate concrete results, presented and shared solutions with visuals.	
Extreme Citizen Science's Intelligent Maps Project*	The project designs, develops, evaluates and deploys methodologies and tools that enable people with no or limited literacy to use smartphones and tablets to collect, share, and analyse (spatial) data.	Neighbourhood
Fab City Grand Paris (FCGP)*	Fab City Grand Paris is a local network of makers, designers, architects, urban farmers and innovators engaged in the rise of the circular and collaborative economy in the Parisian urban area.	City
Fighting Blindness	Fighting Blindness is an Irish patient-led charity with a vision to cure, support and empower. Through education and advocacy working tirelessly to empower the people in Ireland living with blindness or vision impairment.	Nation State
Fine Feathers Make Fine Birds*	It is a design challenge organised by Cube design museum in Kerkrade (NL), initiated by a Dutch medical doctor, in which a multidisciplinary student team used design thinking methods to find solutions in co-creation with museum visitors and different stakeholders. The aim of this project is to develop a clothing concept that allows people own clothing to be adapted so that it becomes suitable when they become dependent on care or nursing and thus allowing them to keep their own identity.	Nation State
FRACTALS: Agrishares	It is an online marketplace (sharing economy) for agricultural machinery, equipment, and services. When unused resources are shared their value increases, for businesses, individuals and the entire community.	Nation State
FRACTALS: MyLocalFarm	MyLocalFarm is a platform enabling wholesale buyers and local horticulture farmers to find each other by helping farmers to create business relationships through the creation of informal groups.	EU
FRACTALS: Smart Plant online platform	It aims to provide precise and accessible data in real-time on risks in the appearance of pests and diseases for a specific crop, in a specific location.	EU
GameLab	The GameLab is running three main sets of activities, called JAM-brella, to meet the defined objectives and purposes: Training of low-skilled end-users, running game jams and community of communities dimension.	EU

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GovLab Arnsberg	The GovLab Arnsberg was founded in April 2018 and is an initiative and organisationally part of the Arnsberg district government. The aim is to test innovative technologies, working methods and processes in administration in order to make administration easier, faster and better.	Region
GovLabAustria	GovLabAustria is an innovation lab for the public sector and should make it possible to address central challenges of the public sector in an open and interdisciplinary experiment space and to develop cross-organisational solutions with the involvement of relevant stakeholders in a scientific and practical context.	Nation State
GRO SELV	The case aims at exploring opportunities for upcycling, recycling and seasonal experiences in people's lives. GRO SELV cooperates with a wide selection of entrepreneurs, cultural creators, craftsmen, designers and others, with the aim of establishing GRO SELV communities in several Danish cities.	Nation State
Growstack (Copenhagen Foodtech Community)	The Growstack case is launched as a Copenhagen based three-month pilot project established by IDA, Nextfood and Copenhagen Foodtech Community from March 14th 2018. The goal is to spread open-source innovation principles for vertical farming across the globe.	City
Guldminen	Guldminen is a laboratory for developing new ways to recycle, upcycle, repair, redesign and distribute resources from Vasbygade Recycling Station in Copenhagen. It has run from 2015 to 2018.	City
Home Office crime reporting tool	A project run by UK's Home Office and Policy Lab initiated around 2015. The aim was to develop a new online reporting service in the UK which could save around £3.7 million if it is offered nationally on police.uk. The idea was developed in a user-centred way and has been iterated and improved time and again with users.	Nation State
hOPENING DEMENTIA – um projeto de intervenção	The hOPENING DEMENTIA programme is an integrated project within the association "Design Includes You". It seeks to develop activities that stimulate logical argumentation, enabling all those involved to feel an active part in the problem, and in the solution.	City
Ilona - Robot Brings Joy in Elderly Care**	Within Lahti Living Lab, a case study was conducted to identify the impacts and acceptance of care robot implementation	City

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	among users in elderly care services - care personnel and elderly customers - with the help of the Human Impact Assessment approach.	
inDemand**	inDemand is a new model where Healthcare organisations and companies co-create Digital Health solutions, with the economic support of public regional funds in three pilot regions: Murcia Region (Spain), Paris Region (France) and Oulu Region (Finland).	Region
Inicjatywa Mikropark	The case aims to create a new approach to organise urban space infrastructure in a friendly way that meets the need of inhabitants, for example to meet, rest, play and work in the open air.	Urban district
Innovation Loop Region Västerbotten*	The innovation loop is a process formed and currently implemented in the county Västerbotten, in the northern parts of Sweden. The main purpose is to create the best possible atmosphere and excellent opportunities for ideas and innovation to flourish.	Region
Innovation Strategy for the Capital Region of Denmark*	In 2017, DDC conducted a strategy process for the Capital Region of Denmark framed by design thinking and design management methods and driven by the regional administration's desire to support innovation environments that secure consistently high levels of quality when new knowledge is implemented.	Region
Institute without boundaries	Founded in 2003, the Institute without Boundaries (IwB) at George Brown College is a Toronto-based educational program and studio that works towards collaborative design action and seeks to achieve social, ecological and economic innovation.	City
Involve - data sharing for public benefit	Involve worked with over 120 stakeholders in six local authorities to develop a framework to help to develop a clearer picture of the acceptability of different data-sharing proposals.	Nation State
IrrigNET	IrrigNET is a service that enables the improvement of crops production by optimising the irrigation process. The mathematical models of a specific crop (initially sugar beet) and soil structure are fed with data generated by sensors deployed in the field (soil temperature, humidity).	EU
Islington Council Health and Social Care	In this case, co-production is embedded across Adult Social Care commissioning for example co-designing and procuring	Urban district

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	services, co/peer-led service delivery, co/peer research, evaluation, and representation.	
Jovem Autarca / Santa Maria da Feira Municipality	A project that aims to promote citizenship, to value young people's opinions, their ideas and perspectives for the future. By taking an active part in the political decisions of the municipality, the elected youth play the role of spokesmen for their peers, being responsible for the assigned budget.	City
KEEPROP	KEEPROP is an affordable web and mobile software for automated maintenance management. KEEPROP target markets in which the assets are mobile or dislocated and where simple and affordable maintenance management online software is needed.	EU
Kommunales Labor sozialer Innovation Dortmund (KoSI-Lab)	KoSI-Lab Dortmund/ Social Innovation Center Dortmund aims to establish a space and processes for the creation of social innovation in the city. It is based at the economic development agency of the city of Dortmund as an innovation unit.	City
Krakowski Alarm Smogowy (KAS)	Krakow Smog Alert is an initiative that group Krakovians who want the city to be safe and clean. KAS is working on regional, national and international levels by initiating activities aimed at lobbying on introducing new regulations and taxes, running awareness actions and campaigns, learning by doing how to change transport habits, mapping the smoky areas, testing tools.	Region
Lab of Collaborative Youth (LoCY)**	It is a Porto-based initiative/project that aspires to support Youngsters in their self-empowerment as learners, citizens and co-creators, meanwhile giving an opportunity to other stakeholders to reflect on this processes and possible changes in their methodologies on how to follow Youth transformation.	Neighbourhood
laboratoire d'innovation sociale (Labis)	The aim of the Social Innovation Lab approach is to create systemic change and to tackle societal challenges. The approach is used by a Canadian NGO.	City
Laboratório Cívico Urbano - Aveiro	This lab is seen as an informal place for gathering, exchange, and development of bottom-up initiatives with other members of the community, promoting public and civic engagement in policy-making related to Urban Development and Territory.	Neighbourhood
Laboratórios de Participação Pública	The laboratories aimed at gathering local people, municipal authorities and a regional higher education institution to design and prioritise ideas for setting the agendas of research to be developed at the regional level.	Region

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Le Dôme - TETHYS	Via co-design methods and co-prototyping with citizens, this project aims at finding uses of hydrogen via questioning the development of hydrogen as an alternative energy source in society at a regional level but linked to a nationwide agenda.	Region
Library Living Lab (L3)*	The Library Living Lab (L3) is an open, participatory experimental space, fully integrated with a public library in Barcelona Area. The aim of the project is to create a physical space, build the ecosystem around it and implement the necessary methodologies that allow all stakeholders to jointly explore how technology transforms the cultural experience of people.	Neighbourhood
LiveCities platform	The LiveCities platform is a digital social innovation project co-funded and developed within the Barcelona Lab ecosystem. It provides a digital collaboration environment that enhances the value of innovation by connecting people to share resources, data, and knowledge to solve together the challenges that concern them.	Urban district
Livret: Giv mig lov til at spise	'Livret' is focused on creating new and better municipal food service for the elderly, because of more elderly in the future and less people to take care of them, higher demands from the elderly to municipal service, and big market potential for private companies within public food service.	Nation State
LTsER Montado**	The project combines the practice, productive, ecological as well as cultural aspects of socio-ecological systems to promote improved management of cork trees forests and help facilitate the wellbeing of montado in the long term.	Region
Maison du développement durable	Eight socially and environmentally minded organisations have united to create the Centre for Sustainable Development, which offers space for reflection, innovation, education and the meeting of minds on sustainable development.	Nation State
Make-It	MAKE-IT is a Horizon2020 European research project focused on how the role of Collective Awareness Platforms (CAPS) enables the growth and governance of the Maker movement, particularly in relation to Information Technology, using and creating social innovations and achieving sustainability.	World-Wide
MakeToCare	MakeToCare investigates the existence of an emerging innovation ecosystem characterised by co-creation processes	Nation State

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	developed by user innovators, makerspace, fablabs and research centres.	
Making Sense H2020 Project**	It is an H2020 EU project ICT2015 and aims to explore how open-source software, open-source hardware, digital maker practices, and open design can be effectively used by local communities to fabricate their own sensing tools, make sense of their environments and address pressing environmental problems in air, water, soil, and sound pollution.	Urban district
Malopolskie Centrum Nauki COGITEON	The topic of the project was to create prototypes of exhibits to be part of a permanent exhibition at Małopolska Science Center Cogiteon. The centre will be launched in 2022 in Krakow.	City
MarGov – Collaborative Governance in Marine Protected Areas	The project aimed at the conservation of biological and cultural diversity of a marine park in Portugal, focusing on the construction of a Model of Collaborative Governance, in which all relevant stakeholders could actively contribute to the management of diversity through the promotion of sustainability.	Region
MARINA - Marine Knowledge Sharing Platform for Federating Responsible Research and Innovation Communities*	MARINA is an open collaborative platform that involves societal actors in marine research and innovation. They share information and best practice, co-create solutions to marine societal challenges, generate action plans and put forth policy recommendations based on Responsible Research and Innovation.	EU
MaRS Solutions Lab	As a public and social innovation lab, the MaRS Solutions Lab brings together governments, foundations, corporations, non-governmental organisations, academia, and the greater community to help unravel complex problems from the citizen's perspective.	City
Match Global (earlier Match Export)	Match Global is a design-driven export initiative aimed at Danish companies working with urban development in a broad sense. It responds to an identified need for more specific support and matching services for companies wishing to make an export drive.	EU
Medialab Prado*	Medialab Prado is a programme run by the Madrid City Council's Culture and Sports Department since 2000. It is a place of experimentation in which different local stakeholders can learn to cooperate one with another. There are six labs, each oriented towards a specific aim or approach.	City

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MedyaPin	It is a project realised by SmartLabs which enables companies to establish their own corporate TV. Medyapin allows you to remotely control your TV, projector, videowall, LED display, by making instant content management from anywhere in the world.	Region
Mental Health Reform	Mental Health Reform provides a unified voice campaigning to drive progressive reform of mental health services and supports in Ireland.	Nation State
Midpoint Center for Social Innovation (MCSI)	The MCSI is an interface between government, education, entrepreneurs, and citizens that distributes and embeds Social Innovation into the social fabric. The MCSI features mentorship and advice, information provision, knowledge brokerage, and knowledge sharing.	City
MindLab	MindLab is owned by the Ministry of Industry, the Ministry of Employment and the Ministry of Education, and it's always working together with the colleagues in the ministries on their projects, so the experiments and focus on effect find their way into both policy development and the lives of citizens.	Nation State
Mirrorable*	Mirrorable is a domestic interactive rehabilitation platform developed in 2016 by the founders of FightTheStroke© with the CNR Neuroscience of the Università di Parma. It represents a unique model of home rehabilitation therapy based on the activation of mirror neurons, through gamification and peer-learning processes.	Nation State
Mobile Wellness Management System	By periodic measurement of important health indicators and by providing accurate information about healthy lifestyles, it's possible to empower individuals to self-manage personal health, extend healthy lifetimes, by directing individuals with health problems or has risk factors to a doctor on time.	Nation State
Museomix*	Museomix is a three-day hackathon that takes place once a year in different museums around Europe. Museums propose challenges to multidisciplinary teams that respond to these challenges by designing functional mediation devices as prototypes.	Neighbourhood
NESTA - Everyone Makes Innovation Policy - 10:10's Heat Seekers' Quest**	The case aims to explore the ways to recycle wasted heat through a 'heat seeking quest' where the public was invited to walk through the streets of London with thermal cameras measuring areas of heat loss.	Urban district

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NHS Hack Day	A Hackathon that brings together healthcare professionals, developers and designers with, patients and their relatives, representatives from charities and more to develop solutions in healthcare technology.	Nation State
NHS: Always Events®	Always Events is a co-production quality improvement methodology that seeks to understand what really matters to patients, people who use services, their families and carers and then co-design changes to improve the experience of care.	Nation State
ninux.org **	The case concerns an emerging typology of grassroots information infrastructure for digital communication, defined as a wireless community network (WCN). WCNs are bottom-up infrastructures built and self-managed by "communities" of voluntary people like hackers, geeks and lay people.	City
Ocean Living Lab - Smartifier Case*	It is a Finish product developed and tested in the framework of a regional funded project which was looking for an international partner to develop their service design further, gather feedback from local users in other countries (Spain and France in this case) and internationalize their service.	EU
Open Living Lab Days Krakow 2017	OpenLivingLab Days are the annual summit of the worldwide Living Lab community, formally the ENoLL Summer School. The annual four-day event includes interactive sessions, workshops, and lively discussion panels with excursions and off-site visits with the aim of giving the participants a wider insight about models, theories and technologies related to Living Labs.	World-Wide
OrganiCity	OrganiCity is a service for experimentation, which explores how citizens, businesses and city authorities can work together to create digital solutions to urban challenges. OrganiCity supported 43 experiments over the three years of the project.	Urban district
Oslo Living Lab / Nabolagshager AS	Oslo Living Lab is a business started and run by youth. While the end goal is to create a sustainable business model based on diverse sources of income, the first pilot project involves composting organic waste from local businesses, packed into growing kits sold to private consumers.	Neighbourhood
Patient Innovation. Sharing solutions, improving life.	Patient Innovation is an online platform to which patients and caregivers worldwide can access to share solutions for addressing health problems developed directly by themselves or with the help of collaborators. The solutions are reviewed by the	World-Wide

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	PI medical team. Only validated solutions are published on the platform.	
PharmaFactory	Pharma-Factory is a research project focussing on Molecular Farming. In Pharma-Factory, qualitative methods such as interviews and co-design workshops are used to determine the nuances and contingencies of positive or negative opinions of plant molecular farming end products and methods of production.	EU
PIKSL - Person-Centred Interaction and Communication for More Self-Determination in Life**	The case aims to facilitate (digital) participation in society and enable a self-determined life by providing PIKSL labs with an open space for inclusive exchange, learning, and co-development. The labs are accessible for everyone, but the focus is mainly on people with learning difficulties. These people are actively involved in co-creation processes.	Nation State
Plano Municipal de Juventude 3.0	Municipal Youth Plan 3.0 was a project which in theory should have been co-created between several actors like researchers, local authorities, youth, and civil NGOs, local young citizens, schools or public institutions. The main goal was to draft a state of art on youth, strategies, and actions to youth participation.	City
Portugal: Ambiente em Movimento	PAeM is a participatory mapping exercise to catalogue, characterise and analyse environmental controversies in Portugal. The project was started by an international multidisciplinary group of researchers that invited NGOs, unions, journalists, policymakers, and individual citizens to assemble a wide range of documentation related to environmental problems, and devise ways to make it public.	Nation State
Program akceleracj firm ScaleUP KPT	The best start-ups operating in the field of industry 4.0, IIoT and Smart city have been selected for a three months acceleration programme. They participated in a series of workshops, trainings, matchmaking, and technology transfer actions. Final solutions were presented during Industry Innovation Day.	Region
PROSPECT: Gum Health for Better Diabetes and Cardiovascular Health	It is a London-based pilot project looking at whether co-creation of research surrounding gum disease and diabetes and cardiovascular health will lead to better knowledge dissemination and public awareness campaigns surrounding the issue. It is run by the Eastman Dental Institute.	Neighbourhood
QSEC2 - Questions de sciences, enjeux citoyens	Qsec2 project aims to foster dialogue between various stakeholders, citizens, researchers and policymakers around the	City

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	impact of science and technological issues on citizens and society as a whole.	
Redesigning packaging	The purchaser, a pharmaceutical company, wanted to integrate the feedback of end-users in their new packaging design. The main research question was 'what should the packaging of medicine look like for it to be used correctly and safely?' To explore this research question, co-creation sessions with patients, pharmacists, and nurses were organised.	EU
RedSec	A mobile phone case and app were developed to ensure that users can safely and comfortably use their smartphones while walking by removing factors like falling or hitting to some obstacles on their way.	World-Wide
REHABILITY	REHABILITY games are a healthcare solution co-designed with neurological patients, physicians, and a multidisciplinary team. It is an entrepreneurial project that aims to distribute on the market healthcare solutions developed thanks to research and co-creation processes.	Nation State
REMODEL*	REMODEL is an initiative to explore how manufacturing businesses can use open source methodology and principles to develop environmentally sustainable and economically sound business models in the manufacturing of physical products.	Nation State
RETRACE – Interreg Europe Project*	RETRACE (REgions Transitioning towards Circular Economy) aims at promoting systemic design as a method allowing local and regional policies to move towards a circular economy when waste from one productive process becomes an input in another, preventing waste being released into the environment.	Region
Rottefælde Hackathon (prototypes)	This case aimed at exploring co-creation as product hackathons developing 'smart' rat traps for the City of Copenhagen by gathering decision-makers from the technical department of the City of Copenhagen, the pest unit (specialists) and makers.	City
Science Frugale**	Science Frugale is a forum-exhibition exploring how to do low cost experimental scientific research by hacking various available technologies, at the crossroads between experimental scientific research, maker culture, and cooperation with developing countries.	World-Wide
Science Hack Day	Science Hack Day is a two-day-all-night Hackathon where scientists work together with designers, developers and other citizens to prototype science-related products. Based in the US,	Neighbourhood

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	SHD is a decentralised project. The organisation provides support to local organisers wanting to run an edition on their local communities.	
Sciencewise – Involve and UK Government BEIS*	Sciencewise provides evidence of public views on emerging areas of science and technology by supporting government departments to design, commission and run deliberative public dialogues. This improves the effectiveness of policymaking by strengthening the evidence on public perspectives and values.	Nation State
SEEDiA testowanie inteligentnej ławki solarnej	The aim is the validation of the functionality and useability of the solar bench to understand obstacles and opportunities in reaching the public clients, the decision process and procurement procedures of administration.	Urban district
SELFMADE - Der inklusionsorientierte MakerSpace im UK-Büro in Dortmund	The case aimed to co-create and co-design innovative solutions for enhancing the quality of life of people with disabilities. In a first step, an inclusive makerspace was co-created aiming at the empowerment for the target group using the creative spaces provided by 3D-printing in a second step.	City
Será que o mar vai engolir o Bairro?*	This project promotes the meeting of lay people and researchers for the co-creation of locally relevant open research questions -- related to the evolution of the sea near a precarious neighbourhood -- and the participatory documentation, study, and communication of the problem.	Neighbourhood
Services4Migrants nel framework Open4citizen	OPEN4CITIZENS aims to involve citizens into a co-design process (hackathons), together with IT experts, public administrations, interest groups, and start-up companies, in order to develop new services to improve urban quality and certain aspects of their everyday life.	City
Sharing City Umeå**	Sharing City Umeå is a test-bed for sharing economy activities in the city coordinated by Umeå municipality. The purpose of the program is to share resources in a city more effectively, sharing knowledge between the participating cities. Sharing Cities are also based on the principles of open source and open data.	Region
SIC (Social Innovation Community project) experimentation in the City of Turin	The case aims to experiment with co-design tools in the public sector to develop new services under the Social Innovation paradigm. The case represents a long term of experimentation (9 months) with a public organisation (municipality).	City

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Sliperiet / Den Koldioxid snåla Platsen (The Low Carbon Place)**	Sliperiet is a cross-disciplinary, collaborative and experimental platform at the Umeå Arts Campus. It is a place where researchers, businesses, students, entrepreneurs, and creatives meet to develop and realise ideas.	Region
Smart Greater Copenhagen	With the aim of an ambitious and holistic strategy that brings municipalities, citizens and companies together around a common course for the digital society of tomorrow in Greater Copenhagen, the Capital Region of Denmark and the Danish Design Centre have engaged in a partnership.	Region
SMART.map / RoadMAPs to Societal Mobilisation for the Advancement of Responsible Industrial Technologies	SMART-map is an H2020 project that aims to define and implement roadmaps for the responsible development of technologies and services in precision medicine, synthetic biology and 3D printing in biomedicine.	EU
Smart Kalasatama Well-being Centre**	The aim of the piloting program was to co-develop and experiment new solutions that improve the resident's well-being. The Kalasatama Health and Wellbeing Centre, corporate partner Kesko's occupational health and the residential district served as a Living Lab.	Urban district
SMART_KOM. Kraków in Smart Cities Network*	The aim of the project was to build a smart strategy for sustainable and smart city development, including effective management, addressing the needs of citizens, using modern technologies and tools in order to improve the quality of living across the entire Municipality of Krakow and surrounding area.	City
SmartLab	The current development of policies and activities related to smart cities technology is reaching a high degree of maturity. On the other hand, the development in the cities is not accompanied by a similar development in rural areas. This gap emerges as an opportunity for Guadalinfo Living Lab network, and for living labs in general, because of their capillarity and the ability to influence regional policymakers.	Region
SMOGATHON	The awareness is raising about the air pollution among inhabitants of Krakow and KMA, and on the technical side finding the scalable, easy to be implemented technology-based solutions to face the problem. Smogathon is a bottom-up initiative aiming to fight smog with innovations and technology.	World-Wide
Social Cities	The case aims to develop a new method to measure, design and implement socially sustainable solutions in collaboration with	World-Wide

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	citizens, politicians, and corporations in order to improve liveability and social cohesion in cities.	
Social Innovation Lab Kent (SILK)*	The Social Innovation Lab Kent (SILK) is a small team based within Kent County Council set up in 2007 to 'do policy differently'. The early projects led to the development of a human-centred methodology and toolkit which draws on tools from social science, community development, business, and design.	Region
SPARKS – Rethinking innovation together*	Rethinking innovation together was a major awareness-raising and engagement project to promote RRI through the topic of technology shifts in health and medicine. It took shape via a traveling exhibition and a set of participatory activities taking place in 29 countries.	EU
STARDUST	The idea developed within the project was to open the experimental website, with innovative design and proposals for the city of Trento, to citizens and stakeholders, so that they could contribute to promoting ideas, vote for suitable and realistic solutions proposed.	City
TCBL (Textile and Clothing Business Lab)	The case aims to create a network of European labs for developing new innovative ecosystems for the textile industry. It gathers makerspaces and local manufacturers. New production and distribution technologies, innovative organisational models and creative energies are opening up opportunities to bring production capacity back to Europe.	EU
The Australian Centre for Social Innovation (TACSI)*	Formed in 2009 as an initiative of the South Australian Government, TACSI is now an independent social enterprise working on projects and initiatives across Australia. The purpose is to create better lives by shifting systems, demonstrating what is possible, and developing replicable approaches to social innovation.	Nation State
The BrainHack Project*	The BrainHack Project aims to connect scientists, artists and the general public who are interested in human-brain-generated signals. The BrainHack Project's main goal is to inspire both scientific and artistic communities to use the BNCI interfaces, to engage with all the different facets of brain research.	Nation State
The Intellectual Disability Supplement to The Irish	IDS-TILDA is a longitudinal study researching ageing in Ireland among people with an intellectual disability aged 40 and over. The underpinning values are inclusion, choice, empowerment,	Nation State

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Longitudinal Study on Ageing (IDS-TILDA)	person-centred, the promotion of people with intellectual disability, the promotion of best practice and to make a contribution to the lives of people with intellectual disability.	
The Irish Platform for Patient Organisations, Science and Industry (IPPOSI)	IPPOSI is a patient-led organisation that works with patients, government, industry, science and academia to put patients at the heart of health innovation. Meetings, workshops and training days are organised to promote this objective, for example in the field of rare diseases, clinical trials or any other relevant topics that will promote patient understanding and patient involvement in the treatment and decision-making processes that affect them.	EU
Thread In Motion	The company specialised in wearable technologies for industrial applications to reduce failure rates, increase production speed and ensure efficiency. TIM has set the goal of digitising the existing one instead of replacing it and to produce customer-oriented technologies.	World-Wide
Tilburg Social Innovation Lab (TISIL)	The Tilburg Social Innovation Lab was a cooperation between the lab-function between four knowledge institutes. TISIL arranged several "Blue Sky Sessions", in which different stakeholders and different knowledge carriers, like scientific knowledge but also "street knowledge" were brought together around a challenge.	Region
Tips and Tricks	Tips and Tricks were developed in collaboration with female activists from Bristol, UK, academics, and Living Labs in the ENoLL network. They are a series of recommendations and reflections for successful engagement with new stakeholders, with each 'tip' represented as a colourful illustration.	World-Wide
Trash2Cash	Trash-2-Cash was an EU funded research project which aimed to create new regenerated fibres from pre-consumer and post-consumer waste and proposed a new model where paper and textile waste is recycled chemically - resulting in fabrics that are the same quality as new materials, to make products that are industrially replicable and infinitely recyclable.	EU
UCL Centre for Co-production in Health Research	The Wellcome Trust has funded UCL through an institutional strategic support fund to develop a new centre for co-production in health research. The centre is being co-produced with academics, practitioners, and patients through a series of pilot projects which look to see how the centre will operate.	Nation State

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Urban Mediaspace Aarhus Project – Dokk1*	The case aims at exploring the participatory method adopted to develop the project of a new public building and services in Denmark, involving citizens, employees, the services' main users and local stakeholders over the years, applying a new form of governance in public services and spaces.	City
USEFIL: Unobtrusive Smart Environments for Independent Living USEFIL	It is an EU-based project run by Universities, research centers, and private companies, focusing on the user acceptance and understanding of user interactions, to develop low cost "off-the-shelf" technology, assisting older adults to maintain their independent living and daily activities.	EU
Woelab - Hub Cité	The idea is experimenting and developing a smart city in an African city, involving citizens in open innovation community-based environments. This experimentation is based on creating networked places that self-organise by interacting with each other.	City
Zarząd Zieleni Miejskiej w Krakowie	The aim is to improve the quality of public space, including green zones, with the participation of the city inhabitants and to encourage them to co-create public spaces.	City
Zentrum für gute Taten (KoSI-Lab Wuppertal)	The Center for civic engagement has been promoting the voluntary commitment of all generations in Wuppertal since 2013 and created KoSI-Lab as an innovation unit that solves public problems in co-creative processes.	City

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