SISCODE CO-DESIGN FOR SOCIETY IN INNOVATION AND SCIENCE

# DELIVERABLE 3.2:

# CO-CREATION LABS: SOLUTIONS AND POLICIES

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## LIST OF ABBREVIATIONS

| ABBREVATIONS | EXPLANATION |
|---|---|
| FAB LAB BCN | Fab lab Barcelona situated in the Institute of Advanced Architecture of Catalonia |
| POLIFACTORY | Fab lab Politechnico di Milano situated in the Politecnico Design Campus |
| UNDERBROEN | Fab lab situated in Copenhagen |
| KTP | Krakow technological park, living lab partner situated in Krakow |
| PA4ALL | Precision agriculture for all, living lab partner in Novisad |
| THESS4ALL | Thessaloniki for all, living lab partner in Thessaloniki |
| CIÊNCIA VIVA | Science gallery and museums partner in Lisbon |
| CUBE | Science gallery and museums partner in Limburg |
| SGD | Science gallery Dublin, partner in Dublin |
| TRACES | Science gallery and museums partner in Paris |
| ICT | Information and communication technology |
| RRI | Responsible Research Innovation |
| STI | Science, Technology and Innovation |
| SDG | Sustainable Development Goals |
| 5WS | 5WS is method where designers reflect on 5 basic questions for defining a problem : what, why, where, when, who ? |
| WP | Work package |

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## Executive Summary

This deliverable aims at describing the first steps of the co-creation process conducted in each of the SISCODE lab from February to July 2019, from the analysis of the context to the ideation phase, and introduces the first description of the solutions that each lab will co-produce in the next steps and corresponding challenge and policies. Each of the SISCODE pilots, whatever their level of experience and background, have committed themselves to a learning process that is transforming their perspective on co-creation and their ways of working through design practices. *Figure 1* synthesizes the challenge and solutions proposed by each pilot lab.

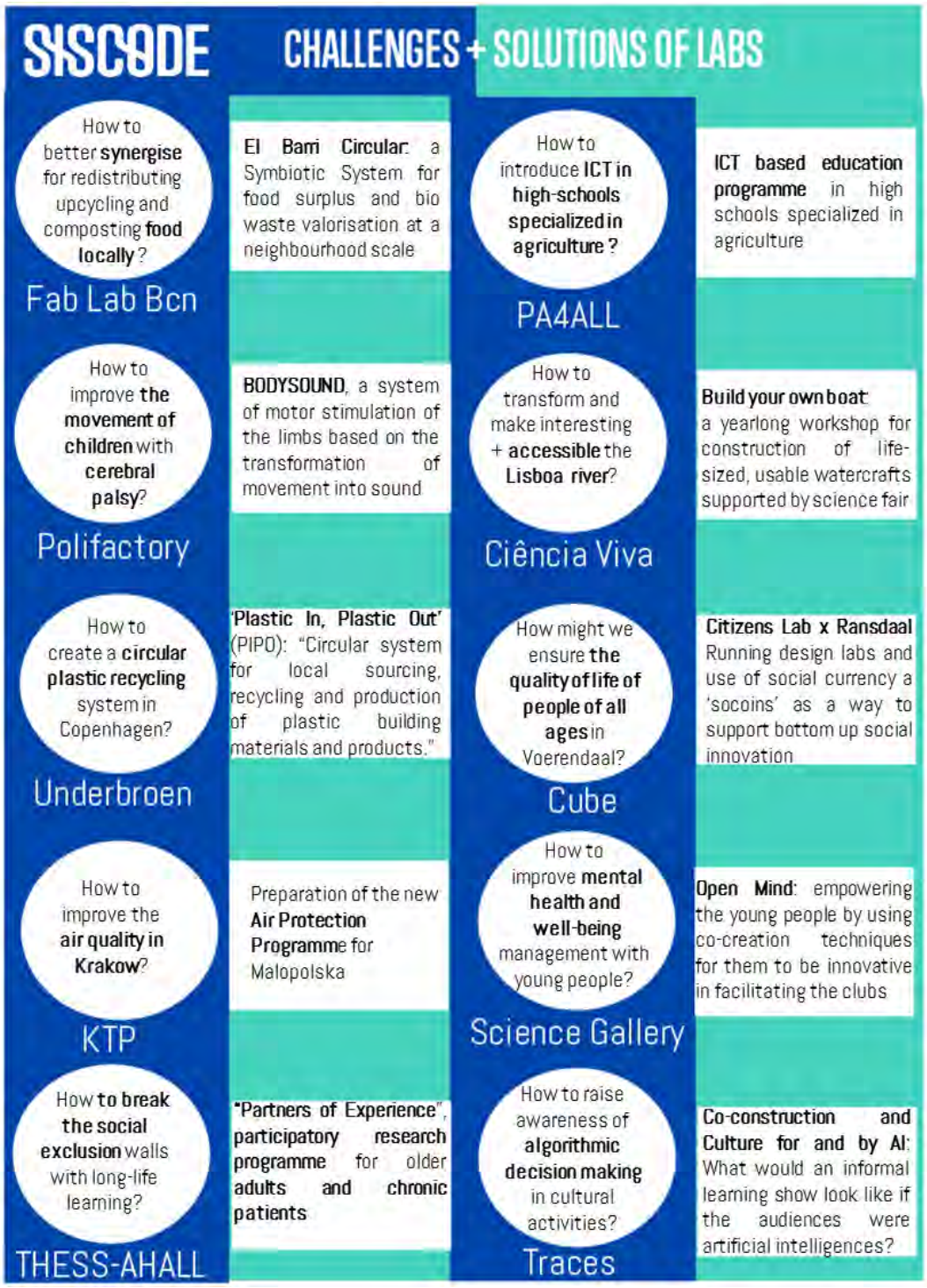



*Figure 1 Synthesis of Lab's challenges and solutions*

Before presenting the description of each lab's journey in detail (Part II) and discussing the lessons learnt and future steps (Part III), a short reminder of the SISCODE co-creation approach will be presented, followed by a description of how labs are cooperating amongst each other, as well as a short synthesis of the activities and a small tutorial about how to read each lab's contribution. The main report is supported by two annexes. Annexes I and II contain key documents illustrating respectively the content of Part I + III and Part II.

Three outputs were synthesized from these first steps and will be better described in part III:

- First, the SISCODE experimentation is enhancing the co-creation capacity at both individual and organisational level through an intense immersion into co-design methodology and tools practice and peer-learning processes.
- Secondly, Labs produce some relevant feedback about the design approach concerning both the use of design tools and the development of soft management skills, going beyond instrumental approaches and developing awareness about the importance of systemic and complex project management skills.
- Finally, the most important effort of the Labs until now in the overall all process of SISCODE Experimentation has been the engagement of different ecosystems of stakeholders and communities. Important feedback and tips are shared by the different Labs with a special focus on public engagement.

They have reinforced their knowledge about co-design, engaged local stakeholders thanks to a first round of workshops, and succeeded in identifying a solution to develop into a prototype to be experimented in the next year.

Starting from August 2019, SISCODE Labs will move from the co-design (of the solution) to the co-production (of the prototype together with their stakeholders), a delicate passage that will be supported through different steps. Building upon recent feedback and discussions during the consortium meetings and in the bi-weekly calls with the pilots and the partners responsible for their development (IAAC, POLIMI and CUBE), 3 specific actions will be proposed in the following months: (1) developing prototype of the envisioned solution for each challenge and experiment with them in order to create common knowledge and feeding the knowledge repository about prototyping, (3) Enhancing the support of the local policy-makers, (4) Ensuring that pilots results are disseminated during the co-production phase in a transversal way at different levels of governance showing the benefits of co-creation and co-design for the real implementation of the RRI dimensions.

# I. A Six months immersion in ten co-creation Journeys

## 1. Introduction

WP3 aims at planning, conducting, monitoring and disseminating high-impact experiments in real-life contexts to investigate the potential of co-creation for the better implementation of RRI. By engaging local stakeholders, the WP has the objective to increase knowledge of co-creation in RRI, proving the effectiveness of co-design to better combine co-construction (ideation) and co-production (implementation) of solutions and policies for the integration of society in science and innovation.

As described in the D3.1 deliverable, 10 experiments are taking place in 10 co-creation labs across Europe, each of them belonging to three networks: the Fab City Foundation, the European Network of Living Labs (ENoLL), and the European network of Science Centres and Museums (ECSITE).

Fab Lab Barcelona, Polifactory, Underbroen, KTP, PA4ALL, THESS-AHALL, CIÊNCIA VIVA, CUBE, SCIENCE GALLERY DUBLIN and TRACES have started their journey at the end of January, and are currently exploring, investigating, designing solutions to address diverse societal challenges such us healthcare, circular economy, data property rights, social inclusion, air pollution, precision agriculture and ocean literacy involving citizens, stakeholders and policymakers.

This deliverable describes the first steps of the co-creation process the 10 labs went through, from the analysis of context to the ideation phase, and introduces the first description of the solutions and policies that each lab will co-produce in the next steps.

## 2. Reminder of the co-creation process

The SISCODE partners have defined co-creation in (Rizzo and al., 2018)[1] as "*a non-linear process that involves multiple actors and stakeholders 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"*.

For the aim of the experimentation, WP3 builds on an instrumental approach and involves the 10 labs in a collective learning experience, "the journey", built around a four-step process and guided by a specific toolbox. The SISCODE Toolbox has been implemented as an open set of tools to operationalise the phases of the SISCODE experiential learning framework (DoA, pg. 25) that aims to facilitate the design and implementation of co-creation journeys for the SISCODE laboratories, focusing on a better understanding and prioritization of the particularities within each context.

The co-creation journey is divided into 4 phases: phase (1) analyse the context; phase (2) reframe the problem; phase (3) envision alternatives; phase (4) develop and prototype. In parallel, two continuous activities have been identified and run to better support each journey: understanding, scanning and synergising with the local context , and engaging stakeholder networks. (*see Figure 2*)

The toolbox (*See D1.2 Annex 1*) is a live set of design tools and canvases accompanied with instructions explaining how the journey will work and providing operational guidance on how, when and for which purposes to use the tools depending on the phases of the journey. (*See D3.1 – Part 1.3 for more details about the toolbox)*

[1] Rizzo, F. et al (2018). DELIVERABLE 1.2: CO-CREATION IN RRI PRACTICES AND STI POLICIES. SISCODE EU project.

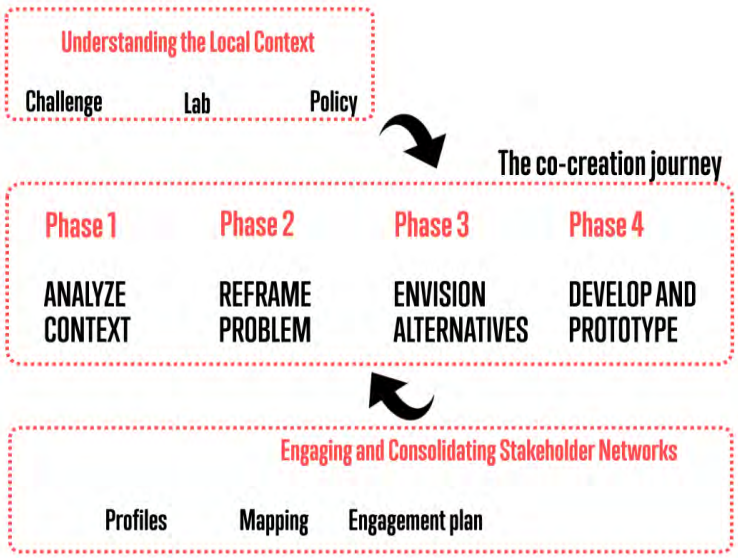



*Figure 2 Overview of the co-creation process proposed in SISCODE*

The use of the toolbox has been crucial for the labs to create 10 co-creation journey plans presented in *deliverable 3.1*. Before February 2019, each lab has identified for each of the phases a series of activities and design tools to apply during their effective journey; built a rich picture of their local context in terms of challenges, (internal lab capacities and policies) and defined a stakeholder engagement plan.

From February until July 2019, labs completed the first 3 phases of their journey and starting in August 2019 the pilots will move into the last phase by starting to develop prototypes and experiment. All this work was achieved with the support of the WP3 broader partners, and management of the co- creation journeys and support actions.

With the diversity of partners involved in WP3 and the ambition to optimise how to share knowledge among the partners, a necessity for a clear and agile model of working has emerged during the first months of collaboration. A proposal (*See Figure 3*) has emerged thanks to the collaboration of diverse partners, after several calls and meetings.

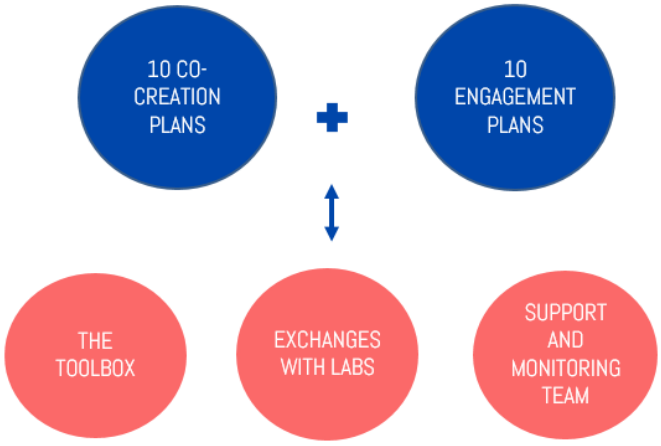



*Figure 3 Overview of the WP3 support team*

Different interventions have been proposed to the labs to be supported and monitored in their co-creation journey:

1- Each lab has access to the toolbox and specific design tools they can apply during their journey.
2- Moments of exchange between labs are regularly planned and managed by the work package leader. The moments can be physical or virtual, through video-conferences. During the period from February 19 – June 19, one physical interaction workshop was organised in Milan as 2-days of peer-learning and experience of the co-creation workshops (*See D3.2 Annex I p. 2*), as well as 7 online calls (*See Annex I p. 3*). Various topics have been discussed during these calls that are seen as collective spaces for each lab to present and discuss their journey, and to be updated about ethics, monitoring, communication, policy, toolkits, and deliverables.
3- A supporting team has been formalised, with dedicated roles (see Annex I p.4). The support team interacts regularly through calls and a specific dashboard created to share the actions of each supporting partner (*see Annex I p. 5*). The support team aims to identify and anticipate the needs of labs at each step, to foster the interactions between labs, and to feed the knowledge repository of the project, as well as making it accessible through events and internal communication.
4- Three tools for monitoring have been discussed and proposed to the Labs: (1) a continuous spreadsheet to report the activities of the journey as well as more general communication activities (*see Annex I p. 6*), (2) a self-assessment questionnaire to evaluate the learning impact of the research action on each co-creation lab's capacity (*see Annex I p. 7*), and (3) more qualitative writing and moments (as deliverables or lab exchanges) used to collectively capture reflexive thoughts on co-creation processes from the stakeholders.

## 3. Summaries of Lab's Activities

The first 6 months (M9-M15) of activities to implement the journey have been dense for the labs. Time to engage, organise, research, ideate, design, and anticipate. Each lab is following the macro-planning presented below:

*Table 1 Duration of the co-creation journey*

| Month (M) | M9 | M10 | M11 | M12 | M13 | M14 | M15 | M16 to M30 |
|---|---|---|---|---|---|---|---|---|
| Phase 1 | Analyse the context | | | | | | | |
| Phase 2 | | Reframe the problem | | | | | | |
| Phase 3 | | | | Envision alternatives | | | | |
| Phase 4 | | | | | | | | Develop and Prototype |

*Table 1* shows that labs have accomplished the first 3 phases, and they are now starting with phase 4 during which they will focus on developing prototypes for their solution and experiment with them. In this paragraph, a short synthesis of the activities of the labs is presented answering the questions:

1- Which societal challenges are they facing? What solutions will be developed?
2- Which types of tools are they using?
3- How many stakeholders / types of stakeholders did they engage?

### 3.1 Which societal challenges are they facing? What solutions will be developed?

*Table 2* presents an overview of the labs' challenges and the solution envisioned until the end of the phase 3. Envisioned solutions will feed the activity of prototyping and experimenting to be developed in phase 4 of the journey.

*Table 2. Diversity of Challenges[2] and Solutions*

| LABS | Reframed challenges | Solutions |
|---|---|---|
| FAB LAB BCN | How to identify and stimulate new synergies among the local community in order to co-develop educational, logistic and environmental supports for better redistributing, upcycling and composting food locally. | Symbiotic System for **food surplus and bio waste valorisation** at a **neighbourhood** scale |
| POLIFACTORY | How to improve **the movement of children with cerebral palsy** thanks to **sound-based innovative solutions**? | BODYSOUND, a system of **motor stimulation** of the limbs based on the transformation of **movement into sound** |
| UNDERBROEN | How can local micro entrepreneurs, SMEs, commercial resellers and citizens collaborate in a **circular system plastic recycling** production model in Copenhagen? | 'Plastic In, Plastic Out' (PIPO)<br>"**Circular system** for local sourcing, recycling and production of sustainable **plastic building materials and products**." |
| KTP | How to improve the **air quality in Krakow** by motivating **citizens to change** their ecological attitudes and to support decision makers with relevant instruments for the **co-creation of local new policies**? | Preparation of the new Air Protection Programme for Malopolska |
| PA4ALL | How to introduce **ICT in high-schools specialized in agriculture** in a way that fosters the development of specific skills, greater connection to market needs and relevance for agriculture of the future**?** | **ICT based education programme** in high schools specialized in agriculture |
| THESS-AHALL | How **to break the social exclusion** walls and welcome older adults and chronic patients back to society with a **life-long learning programme**? | "Partners of Experience", **participatory research programme** for older **adults and chronic patients** |
| CIENCIA VIVA | What interesting, mobilizing**, safe and accessible experiences** could our co-lab create in the river in this part of the city? | Build your own boat/Bring your own boat<br>A yearlong workshop **for construction of life-sized, usable watercrafts** supported by **science fair about river access** and ocean literacy |
| CUBE | How might we ensure the quality of life of people of all ages living and growing up in the context of an **ageing society**, now and in the future, drawing on the **self-organizing potential of the community in co-creation** with policy makers, in Voerendaal? | *Future Citizens Lab x Ransdaal - Toekomstburgerslab x Ransdaal* - 'Running design labs and use of social currency a 'socoins' as a way to support bottom up social innovation |
| SCIENCE GALLERY | How to improve mental health and well-being management with young people in a secondary school setting? | OPEN MIND: **empowering the young people** to understand the importance of hobbies for **their mental health**, while using co-creation techniques for them to be **innovative in facilitating the clubs** |
| TRACE | How to organise **interactions** between research, education, civic right and policy making in order to identify ways to **raise awareness of algorithmic decision making within general cultural activities**? | Creation of a collective intervention reflecting on how **Automated Decision Support** can be a target for educational / cultural activities. What would a theatre play, or an informal learning show look like **if the audiences were artificial intelligences**? |

[2] *(see an overview of the Kumu map of concept in Annex I- p. 8)*

## 3.2 Which types of tools are they using?

Even if the richness of the SISCODE experimentation bases itself on the specific approach carried out by each lab in a specific context and network of stakeholders, a first synthesis of tools and methods effectively used by labs during the 3 first phases of their journeys is proposed in *Table 3*. As the phases were running in parallel for most of the Labs and in an iterative way, activities sometimes overlap.

*Table 3 Diversity of activities and tools used by the Labs*

| Phase 1 – Analysing context | Phase 2 – Reframing Problem | Phase 3 – Envisioning Alternatives |
|---|---|---|
| Synthesis- tool<br>Problem Definition canvas | Synthesis- tool<br>Idea Card canvas | Synthesis- tool<br>Experimentation canvas |
| Desk research: Literature review (publication research via scholar, research gate, keyword bibliometrics, media scanning, key fact), Case-study analysis | Idea, System and opportunity mapping (opportunity mindmap, meta-design canvases, frameboards, checking your challenge, simplified life cycle analysis) | Inspiration tools/learning (cards, evocative images, presentation of synthesis, ice-breakers, learn by doing experiences) |
| Meeting (Interviews - formal or informal - Interest group discussion, conversations) | Stakeholder mapping (actor-network tool, business model canvas, stakeholder visits, pain/gain tool, Personas, empathy map) | Definition (5Ws, Design Briefs) and ideation (idea cards, idea matrix, workshop discussions) |
| Participative observations (POEMS, five human factors) in events, field visits/trips, analysis of product uses | Workshop (communication plan, recruitment, synergy identification, infographics and presentation, ideation session, maker meet-up, interest group discussions) | Scenario building (Back casting, collective storyboard, business model canvas, frameboard, experimentation canvas) |
| Large audience workshops (exhibition, Ill-fated tribunals, world café) | Analytical thinking and comparative analysis (analogous model, survey) | User Interaction Analysis (technological test, diaries, cultural probes) |
| Data analysis and visualisation (geographical mapping, frameboard, mental map, infographics - using illustrator, Inkscape or Pictochart) | SISCODE Peer-learning (bi-lateral exchanges, exchange lab in Milan, steering meeting in Paris, support team calls) | Evaluate and refine (sorting, value hypothesis, principle to opportunities, checking your challenge, idea selection, eco-design and design tools for conviviality, debriefs) |

## 3.3 How many stakeholders / types of stakeholders did they engage?

In deliverables 3.1 and 3.6 labs have already identified the type of stakeholders, the role they can play and some strategies to better identify and engage them in the journey. Stakeholder engagement is a continuous activity at the core of the SISCODE experimentation as all labs are looking for new ways to interact with the local ecosystem to face a societal challenge and involve stakeholder interested in co-producing a stable solution to face the challenge. During the first phases, each lab succeeded in engaging a network of stakeholders, but in heterogeneous ways.

*Diversity in terms of numbers of participants (See Figure 4).* The figure illustrates the reported total number of participants for each lab during each phase. On average, more than 50 people were participating in each phase for each lab. This highlights a good effort from the labs to reach and connect with the local ecosystem. In some labs, such as Fab Lab Barcelona and Underbroen, we can see a progressive engagement all along the phases with a peak during the last ideation phase. It corresponds to the organisation of open events. For the museums, the engagement reached a maximum on the early stage and now it seems they stabilised an active group of stakeholders to work with.

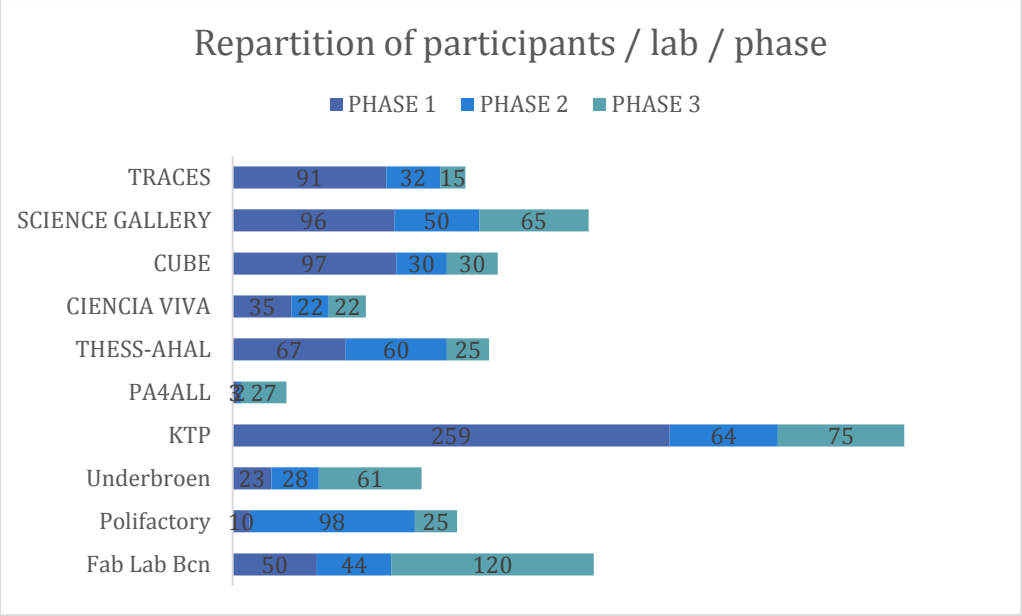



*Figure 4 Overview of the self-estimated involvement of participant by labs and phases*

*Diversity in the methods of engagement for the different types of stakeholders (Figure 5)*. The figure categorizes the number of organisations listed by all the labs in their reporting activities for each category of target stakeholders defined in the SISCODE DoA (Policy Makers, Scientific and research community, Industry and Innovation community, Civil Society, End Users, General Public) and their level of engagement, meaning if each organisation has been: (1) informed; (2) consulted; (3) involved in co-design and (4) co-production activities. All labs combined, an effort on engaging the quadruple helix of stakeholders can be noticed: government, academia, industry and civil society are all taking part in the project in an active way. We observe a lack of solicitation of end-users and the broad public in the first phases as well as a shy engagement of policy makers that were informed/consulted but still poorly participating actively in the co-design/co-production activities. Some exceptions can be found, in KTP and Cube that both succeeded in engaging them clearly and efficiency since the first phases. This issue will be discussed in Part III.

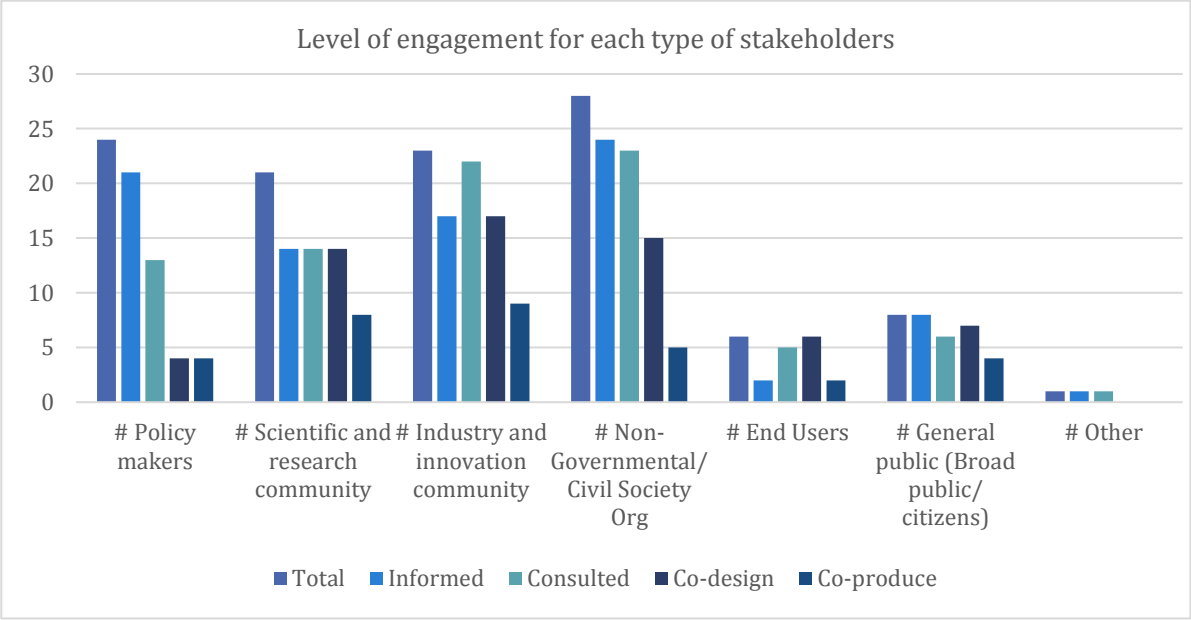



*Figure 5 Overview of the level of engagement for each type of stakeholder*

# II. Capturing the Lab's Experience between co-creation, solutions and policies.

Chapter II will describe the journey of all the 10 labs during the first 6 months of activities.

Structure of the report for each lab

In the present document, for each lab, you can know more about;

- The real activities of labs (Part 1-Implementation of the co-journey)
- Discovering the solution proposed by the labs (Part 2-Solution)
- Finding out how labs are envisioning policies and connecting with policy makers (Part 3 – Policy)
- Having a clear synthesis of each lab activities and stakeholder network engagement (Part 4 - Monitoring Activities).

The content of the different parts is presented in the *Figure 6*.

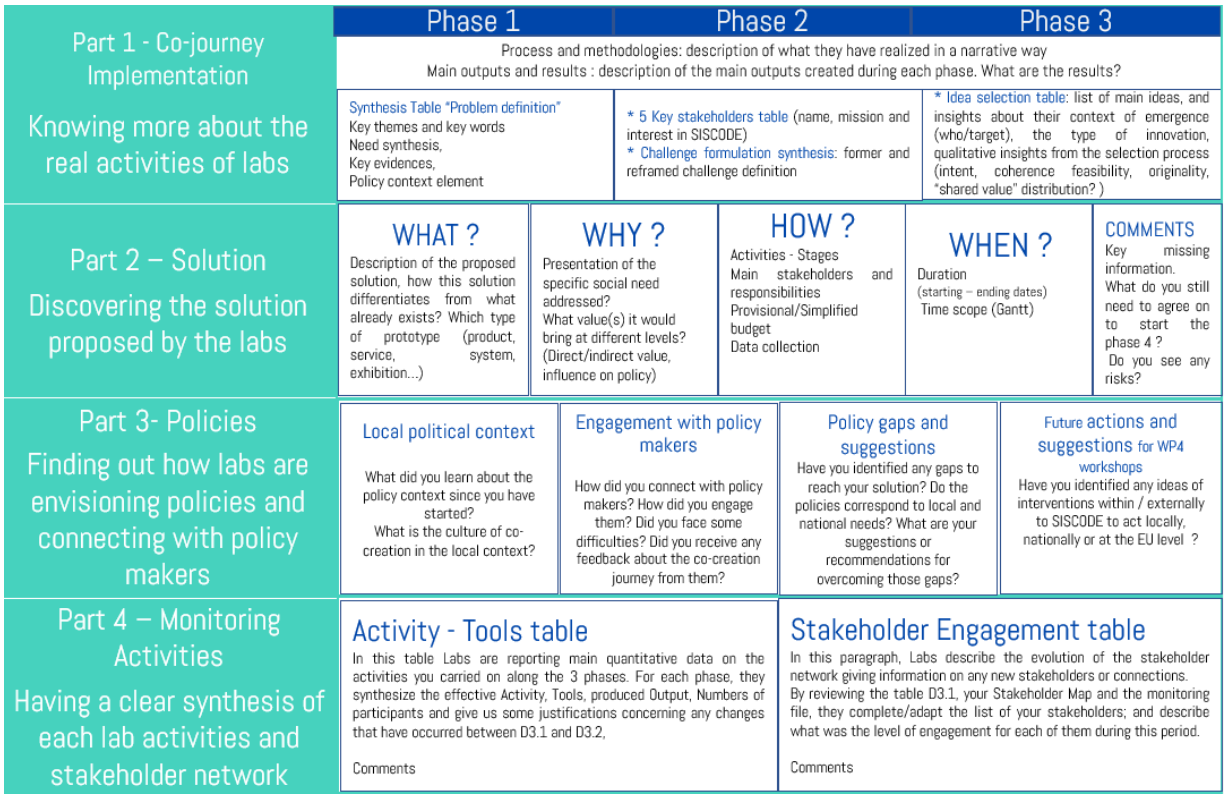



*Figure 6 Structure of the different parts for each lab*

In addition to this main report, visual insights have been grouped in annex II. For each lab, you will find visual information such as photos of workshops, tools, mapping and SISCODE synthesis tools.

# FAB LAB BARCELONA

## Exploring

Food systems, local production, circular economy practices,
Eco-innovative solutions, community synergy, bio-material innovation

### 1. Fab lab Barcelona's journey

Within the dynamic of the Fab City Network, Fab Lab Barcelona's challenge aims at exploring and supporting the transition towards a more circular neighborhood. More specifically, Fab Lab Bcn is looking for fostering new synergies in the neighborhood of Poblenou with a specific focus given to the redistribution and transformations of local food surplus and waste. Through the creation of a pilot identity, Fab Lab Bcn has established *"El Barri Circular #Poblenou"* with the aim of bringing local actors closer to the project proposal. The main stakeholders involved are represented by local markets and km0 restaurants, cooperatives, local associations, urban gardens, composting initiatives, project with food redistribution, makers and material designers.

A mapping phase was crucial to capture the current scenario of initiatives followed by an identification of synergies among the local community. Throughout a series of workshops, an exploration of possible directions was co-created by using selected methodologies to encourage creative thinking and the production of innovative ideas by local actors. The Fab Lab acted as a catalyser to identify potential proposals and drive systemic changes, discussing the opportunities and needs for co-producing customised solutions identified as redistribution of food surplus, bio-waste transformation into organic composting and biomaterials innovation.

Given some similarities among the solutions described, three types of community services were selected to be developed: a specific logistic and resource service for food waste collection and community engagement; a set of knowledge transfer sections to support the local design and production of specific tools; and a collection data system to capture the flows of material, energy and resources of the system.

## 1.1. Fab Lab Bcn's journey implementation

### 1.1.1. Phase 1: Analysing the context

- Process and methodology

The first phase consisted of analysing the context by having a better understanding of the existing instruments for circular economy, identifying the policies about food cycles at the different local scales and analysing the dynamism of Poblenou neighborhood and Barcelona. For this phase, the team participated in 5 policy making events, 35 informal interviews with 50 local actors in order to identify the ongoing policies and resources that are participating in the local circular transition. Moreover, an effort has been done to develop a consistent mapping of current initiatives related to circular economy. The mapping phase focused on spreading awareness about ongoing activities/ projects developed at Fab Lab Bcn/ IAAC that are related to co-creation activities and empowerment of citizens through sustainable and regenerative cities.

- Main outputs and results

The main outputs in this phase were the creation of a timeline of the mapping process, a patchwork of the neighbourhood diversity and a stakeholder mapping of local food cycles. Based on different models of Food Value Chains and Food Waste hierarchies, a stakeholder mapping of local food cycles was developed that defined the possible actions to re-invent local food cycles in neighborhoods (attached). Six main potential areas of interest were selected: small production at homes and urban gardens, short circuits for food, sustainable consumption, collection and logistics of food redistributed systems, innovation by creative upcycling and valorisation through different forms of composting. For each of these topics, the pilot identified several direct stakeholders and a broader ecosystem of supporting structures among public institution, university, zero waste educators, incubators, open platforms and social and solidarity economy. The mapping captures the diversity of initiatives at the city and neighbourhood level according to the type of stakeholders and their roles in the process of food cycles. In that way we could start identifying the local flows, different interactions and potential opportunities. *See the map in Spanish in Annex II p. 10.*

*Table 4 Synthesis Fab Lab Bcn*

| | |
|---|---|
| Theme | Food systems, local production, circular economy practices, eco-innovative solutions, community, synergy, bio-material innovation |
| Need | - Better and more regular connections between local stakeholders and initiatives in the heterogeneous and creative neighbourhood of Poblenou;<br>- Exploring the potential of solutions for local food surplus and waste<br>- Find incentives and practices to invite local restaurants and markets to value their food waste as resources for local crafts and production.<br>- Reinforcing the culture of cooperation, eco-design and making from the Fab Labs to public spaces. |
| Key evidences | Interests and local practices of interviewed/observed stakeholders<br>Potential of extending the local value of food waste (In 2017, the Waste Management Department of Barcelona City Council identified 119.456 tons of organic waste collected at the metropolitan area)[3]<br>Under-development of food waste practices (collective composting)<br>Innovative ecosystems of projects / initiatives<br>Sense of self-organised mode of governance in existing communities |

[3] Waste statistics from: http://www.bcn.cat/estadistica/castella/dades/anuari/cap18/C1801010.htm

| | |
|---|---|
| | High gentrification process at Poblenou district as a result of new urban changes and a consequent distancing of residents in relation to the use of public space decisions. (Barcelona Housing Observatory data show that between 2014 and 2017 rent prices went up between 24% and 28% in the metropolitan area) |
| Main policy context elements | Development of several local plans in favour of food sovereignty, responsible consumption, climate and circular economy: Agropolis and Premet25.<br>*Barcelona + Sostenible* Program has been mapping and supporting initiatives related to sustainability.<br>Key stakeholders of the districts have created a pact in 2018 for a more inclusive and sustainable Poblenou thanks to the co-creation process Repensem el 22@. A plan that aims at promoting access to real estate for local residents and preserving historical patrimony as places for social revitalisation. |

### 1.1.2. Phase 2: Reframing the problem

- Process and methodology

The second phase consisted of shaping the set of data collected to better structure the future interventions with local stakeholders. A first co-creation workshop named "Synergy Soup" was proposed (called "Sopa de Sinergias) destined to a core group of local stakeholders identified through the different interviews, events and participative observations. The event aimed at identifying synergies among the actors by matching local resources with local needs from each stakeholder. It allowed getting to know each other and start creating shared value and a sense of community.

At this stage, the team developed and proposed a plan of co-creation activities to guarantee an effective engagement and collaboration of the local community through an action learning process. The communication plan was redefined according to the target identified. An identity for the pilot was created and named *"El Barri Circular #Poblenou, episod: Food, waste and local crafts."* Social media channels and personal invitations have permitted to maintain the engagement of the core group of stakeholders while opening the challenge more broadly to the community.

- Main outputs and results

The Synergy Soup event has proposed co-creation activities to identify project proposals and new synergies between the actors in the neighbourhood addressing improvements on the sustainability of the current food system. Local actors participated in creative activities while sharing a soup made from food collected in the local area by the organizers.

Concretely, it has consisted in:

- the presentation of the project,
- the restitution of the first mapping (created using reused cardboards, publicity batches and printed materials),
- an ice-breaker exercise where participants have presented themselves while selecting a set of vegetable to integrate to the collective soup,

(4) a co-creation activity in three groups based on a matching tool created by the team and inspired by the approaches of synergy mapping, industrial symbiosis and systemic design tools for circular regions. The event ended with a restitution of each group and a soup ready to be enjoyed by the participants.

Over the Synergy Soup, 58 needs, 36 resources and 31 ideas of projects were generated by participants. Afterwards, the team has categorised them through a matrix grouping the type of innovation with the step of food cycles process. The matrix and project ideas were later exposed during an open exhibition of IAAC, in which the visitors could give insights, feedbacks and suggestions about innovation interventions and food cycles improvements related to sustainability at neighbourhood scale. Then,

five potential categories of ideas were selected: bank of seeds and Fab Yurt, local collection and preparation of recovered food, design of bio-materials, library of things and collective composting.

The core stakeholders involved in "El Barri Circular" can be categorised in 5 categories as shown in the following table.

*Table 5 Fab Lab Bcn key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| S1 – Local associations<br>(Neighbourhood Associations, Taula Eixe Pere IV) | Community engagement, disseminate and discuss issues that involve the residents well-being | Community capacity building; knowledge |
| S2 – Restaurants 0km and cooperatives<br>(Leka, CCP9) | Offer and distribute local and seasonal products | Co-create bio-based products to use in the spaces (packaging, plates, bowls, bioplastic)<br>Be part of local changes<br>Learning from/with neighbours |
| S3 – Urban gardens and composting initiatives<br>(Urbonera + connect Hort) | Regenerating the city and community solidarity.<br>Dissemination and use of composting and vermicomposting systems for individuals and community. | Support for the development of composting systems and logistics in Poblenou.<br>Enhance the potential of urban gardens as social / open-minded communities |
| S4 – Maker spaces and material designers<br>(Macus and Fab Textiles) | Spaces where people gather to make and create. The members share supplies, skills, and ideas, and often work together on projects. | Collaborative projects for material and production innovation, improvement of the local ecosystem of Poblenou; application / learning of technologies |
| S5 – Projects with food redistribution<br>(Taca d'Oli) | Collection of surplus/ wasted food at local markets, meal preparation with volunteers and distribution to low-income population groups | Support with knowledge and solutions to improve logistics for food redistribution |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 6 Fab Lab Bcn Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | The original challenge focused on the field of urban agriculture by engaging students and local communities to contribute to the redesign of future generations of vertical farming systems within a short-loop and innovative approach. |
| Synthetic formulation of the reframed challenge. | Fab Lab Bcn aims at identifying and stimulating new synergies among the local community in order to co-develop educational and logistic supports for better redistributing, upcycling and composting food locally. To do so, a specific logistic for food waste collection and community engagement will be performed. Additionally, Fab Lab will provide a set of knowledge transfer sections to support the local design and production of specific tools; and finally, it will be set up a collection data system to capture the flows of material, energy and resources of the entire system. |

### 1.1.3. Phase 3: Envision alternatives

- Process and methodology

The third phase was composed by five 3 hours-events that happened between the 28th may and 28th June, in which the participants of *El Barri Circular* were actively involved to foster ideation and participate to learning experiences.

- 28th May: Haz Comunidad! A community ideation workshop which took place at an historic community place, "El Ateneu de la Flor de Maig" where 5 concepts were challenged through a redesigned version of three tools: (1) 6Ws to define the ideal solution of each concept and cross the different visions, (2) a sort of back casting-value opportunity mapping challenging the "how" to reach the solution, and identifying needs and opportunities in term of materials, tools, resources and skills, others, (3) an idea cards.
- 8 and 11th June: Two learning by doing experiences has being proposed and co-organised with local participants to raise knowledge and answer the need to "make things together". The Fab Textiles ran a workshop at IAAC for realising biomaterials and bio-composites from local waste collected in restaurants. Three techniques were explored by the participants: 3D extrusion, bioplastic sheets and bowls mold design. The second experience was facilitated by MACUS Cooperative, based on digital fabrication tools and machine design.
- 18th June: Together with three stakeholders (Taca d'Oli, Fab Textiles, Urbonera), a session of eco-design and scenario building has been proposed during a local event about circular economy who took place in Palo Alto, another historical place of the neighbourhood. Three thematic of scenario has been proposed: logistic, bank time and education.

28th June. Finally, a convivial agora was organised with the 40 students of the summer school of Degrowth to discuss about the conviviality of the concepts through specific design tools and refine the proposal of solution to be prototyped.

- Main outputs and results

As a result of the third phase, the participants have refined project proposals, created new learnings and enacted local synergies. Indeed for 31 opportunities identified in phase 2, five concepts with independent community champions has been built allowing the identification of 83 needs, 57 opportunities and 6 idea cards during the community events. The methodology applied was based on specific design tools adapted for the workshop, in which the local actors could break down the challenges, recognize their essential components, make and understand connections with other proposals. Then, an effort has been made to build a local symbiosis model – sort of scenario of solutions integrating all the different food waste project solutions at the neighbourhood level. More than selecting and focusing on each specific solution excluding some stakeholders, the core team has opted to act at the system level, designing a solution system that involves the core stakeholders and identify key collective actions that can ensure more cooperation and mutualisation of means for local learning, design, production and logistics. The scenario was proposed as a first intermediary object of design to model and discuss the future experimentation. It was transformed with the feedback of the internal team members as well as by more informal meeting that occurs upstream and downstream the events. The different processes of activities were developed and presented during the last events so to start identifying effective individual needs and more transversal needs. The participants agreed on the need for collaboration about logistics, sharing of skills, product design and to experiment collectively the search for more viable and inclusive solutions for people involved (see visual documents in Annex I p. 11).

The following table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 7 Idea synthesis*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Fab Yurt | Urban gardens | Products | Use of recycled materials to develop a structure for vertical farming and to host workshops at urban gardens and "Pla buits" or "Empty Space Plan" which offers 20 sites for temporary use. | Not using directly food waste<br>Difficult to find recycled wood with specific size |
| Up Trolley Backpack with functional boxes | Redistribution<br>Baccuinetes logistics | Products | To be done with local materials.<br>Shared value created with makers and social projects | On demand - Not a lot of stock<br>Economic viability |
| Community kitchen | All | Space - Process - Model | Fight individualism<br>Surplus food redistribution<br>Reduce disparity<br>Auto-governance<br>Empowerment | Still at the utopia level<br>Non- adhesion of the mass |
| Circular Egg cups | Cooperatives<br>Makers | Products | Closing the loop locally by transforming eggshell in egg cups/ bowls | Necessary evaluation of material resistance<br>Capacity and means for collecting<br>Economic viability |
| Seed Beer Pots | Beer producers<br>Makers<br>Micro-farmers | Products | Closing the loop locally by transforming beer waste in growing pots or aeroponic pots | Necessary evaluation of material resistance<br>Capacity and means for collecting<br>Economic viability |
| Biowaste plastics tuppers / clothes / | Restaurants<br>Redistribution | Products | Closing the loop locally by transforming biowaste from local restaurants in bioplastic based products | Longevity of the product<br>Cost and system of logistics<br>Economic viability |
| Abono 0km | Residents<br>Urban farm | Process/ products | Creation of community compost from local organic and paper waste. | Diversity of process<br>Individual behavioural changes<br>Logistics and financial means |
| Footprint | All | App | Mapping and connecting project, resources and needs | Voluntary based projects<br>Concurrence in the app markets |
| Library of things | All | Space/ process | Physical space that enables people to borrow items and tools with a contribution cost. | Necessity of a space<br>Quality of materials<br>Insurance/ extra costs |
| Gamify to destigmatise | Compost Collectives | Service / Game | Sensibilization, Evaluation and De-stigmatization project about compost production and use | Lack of originality and means. |

## 1.2. **Solution: the selected idea and future steps**

| *Name of the Lab's solution* |
| --- |
| *Symbiotic System for food surplus and bio waste valorisation at a neighbourhood scale* |

# What?

Fab Lab Barcelona will experiment how to support local stakeholders on the valorisation of surplus food and bio-waste at a neighbourhood scale. To give core of a local circular and symbiotic system, Fab Lab Bcn will foster the means necessary to explore the co-development of three circular community projects connected to the food value chain: food waste redistribution, bio-waste based material development, collective composting. Three types of community services will be imagined, co-produced and experimented with them and a broader set of local stakeholders: a specific logistic and resource service for food waste collection and community engagement, a set of educational moments to support the local design/production of dedicated tools, and environmental measuring set up to capture the flows of material, energy and resources of such system.

# Why?

With the scarcity of resources, the problem of population nutrition and the importance of food waste, people want to reconnect with their consumption and be part in simple but effective circular solutions. From zero waste behaviours to food waste valorisation, citizens can be an active part of the change. They want to develop locally in community, with restaurants, cooperatives, markets, residents, urban garden easy logistic and learning system that ensure the best option of valorisation for each food wasted. For doing so, they need not only times and resources but also places for exploring ideas, sharing knowledge and acquiring locally-sourced-designed-manufactured products. To improve the circularity of food and its valuable waste in Poblenou, there is a need to engage local stakeholders at different level, creating synergies between existing initiatives related to food systems.

# How?

**Activities:** The team will iterate between four types of action: prepare, prototype, test and assess. More specifically, it will consists in (1) maintaining the engagement of the core stakeholders and creating an internal team contributing to the pilot; (2) analysing the needs of training, material provision and tools; (3) defining the restaurants and markets that will collaborate; (4) Evaluating amount and quality of bio-waste to collect; (5) Setting up a plan of logistic for collection and distribution of materials; (6) Organising collective sessions of training to define the type of bio products to explore; (7) Realising an experimentation for a short period of time. (8) Collecting data for further evaluation. (9) Creating a partnership with other initiatives and policy makers to explore new models for social integration and work well-being in circular projects. Iterate.

**Main stakeholders and responsibilities:** The main stakeholders involved will be local restaurants, makers, residents, students, members of urban gardens and cooperatives, local stores, schools. The responsibilities will be defined collectively in a further workshop.

The internal team will work on the coordination and the co-development of events and products. The team will invite three people to join temporary (one employee - 6 months, two interns - 3 months) the project to support (1) the specific development of materials and products for material innovation (testing new recipes and building a 3D printing machines for bio-material), (2) logistical and communication aspects, (3) support the environmental assessment.

**Budget: HR:** One year period, (3 employees - 2 Part time on the pilot) about 50K from June 19 –June 20.

**Direct costs:** 12600€ for material/tools (4500€), external assessment services (6000€), management (2000€) – Policy workshops and Dissemination (3600€).

**Data collection.** Additionally to Siscode project co-creation's assessment, data will be collected during the entire lifecycle of the project in order to further evaluate environmental data at the system level (Material Flow) and activity level (classic simplified LCA). A focus will be done to analyse the impact of biomaterial processes comparing to other types of valorisation and different processes. The grid of assessment will consider material property (biodegradability, resistance, flexibility) and process source of impact (energy/water consumption during all stage). An effort will be done to integrate socio-environmental dependencies.

# When?

**Duration**. The 4th phase is scheduled to begin in September 2019 and to finish in May 2020.

Times scope


# Comments

The description presented will evolve through the next month regarding the effective interests of stakeholders. For now, many uncertainties are still present and the pilot has to consider the different timelines of people engaged and the global financial difficulties of the entities. As it relies mostly on the free participation of many participants, the success will depend on how far the model and proposed activities will be perceived of interests for ongoing project development as for building feasible and viable scenario. Both internal and external risks identified in D3.1 are relevant and a considerable effort need to be done to optimise the internal workload and create bridges to different temporalities, intents and visions on the involved methods.

See Annex II p. 12-13 for the complete description of the Idea canvas and the Experimentation Canvases.

## 1.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context

Co-creation activities have been highly explored in several actions promoted by the Barcelona City Council. For different areas of exploration, policy makers have been supporting direct democracy with a collective policy design process opening the discussions to engage multiple stakeholders. Fab Lab Bcn have identified different programs such as Repensem@22, a directed participatory process for neighbourhood improvements; Climate plan (mentioned in 3.1); Agrópolis, network of food policies; Enfortim, program for social and solidary economy; Impulsem El que fas, a call for grants to finance projects; DECIDIM, a platform of participation to build a more open, transparent and collaborative city.

- Policy Gaps and suggestions

*Table 8 Fab Lab BCN: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Multiplicity and complexity of local ecosystems | Doubling the effort of synergy making and dissemination. Taking time to build clear information to open network. Having clear/transparent strategies that avoid projects starting from the scratch constantly. |
| Complexity of buying - renting second-hand materials within the Fab Lab in Barcelona | Make accessible or create reuse stores<br>Legalise access / purchase on reuse platforms<br>Support the creation of a Scrap Store / library of things<br>Integration of local and "circular" procurement criteria in any organisation |
| Competition between waste hierarchy systems and problem for sizing infrastructures | Create conditions to endeavour the best synergies in term of energy/water use and qualities of the systems |
| Dependencies of money/time | Lobbying and developing time-bank, and base revenue model, investigating the cooperative models |
| Lack of access to education and non-valorising social integration dispositive | Funding special dispositive for skill development, social integration through the participation in local community projects. A possibility to find meaning and usefulness; connecting needs, aspirations and learning capabilities. |
| Lack of resources/times/spaces in Fab Labs for "*free*" projects. (privatisation of Fab Lab) | Funding library of things and maker spaces for local public project development. Investigate beyond the role of fab labs how makerspaces and local manufacturers could be active locally for the city. Create bridges between public/private models thanks to the Fab City Network. |
| Invisibility / saturated market by external shops | Creating a Local and Circular VAT<br>Use and develop local currencies |
| Lack of engagement from citizens | Initiate, support and develop direct democracy |

- Engagement with policy makers

Several policy makers were contacted since the mapping phase in order to better understand the ongoing project, initiatives and regulations promoted by the public administration. Fab Lab Bcn have been connecting with distinct groups of Barcelona City Council, such as Barcelona Activa, Responsible Consumption network, Matins Makers, Barcelona + Sostenible, Food Impulse Strategy Group. Besides the Barcelona City Council initiatives, self-managed independent policy makers were engaged, including Taula Eix Pere IV and Poblenou neighbourhood's representant (@22, Barcelona Direct Democracy). The connection with all these groups were made by engaging discussions, disseminating future actions, participating in local meetings and events. Some difficulties were faced regarding the real involvement of some authorities, probably as a result of the significant amount of community projects emerging in Barcelona. However, even the policy makers that were not actively participating on previous activities, they open possibilities to contact and ask for collaboration once the project starts having results. A specific strategy will be discussed internally in the following months to set up further collaborations specifically on the social models of circular economy and to co-explore solutions for a better transformation of co-creation and eco-design cultures.

- Future actions and suggestions for WP4 workshops

Locally, the team will keep on being involved in the strong dynamism of Poblenou and Barcelona to explore and disseminate the results and projects. Insisting on the community aspect of local production and circular system and using the Fab Lab as a catalyser of systemic changes where emerge and reflect how the combination of technology, design and social organization may activate new mechanisms for sharing knowledge and experiences towards a circular territory. For WP4, it could be interesting to focus (1) on the business models for circular economy in locally productive city contexts or (2) exploring the diversity of models of LABS / third places for fostering viable "social innovations". The Fab City network could be a good "passerelle" to gather stakeholders on such topic. With Underbroen, it could be an interesting collaboration. As we plan to co-produce a booklet for our scenario, a great opportunity remains in designing a collective workshop based on these results. SISCODE could support existing initiatives that were not directly linked to the main challenge, but related to circular economy in some way. There is also a significant potential to use the results and partnership created during the project to assist innovative paths for policy planning allowing a participatory development through co-creation actions.

## 1.4. **Monitoring of the process**

- Synthesis of the activities

*Table 9 Fab Lab Bcn Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments(any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | 1.1 Circular economy (CE) context analysis<br>1.2 Local Ecosystem Mapping<br>1.3 Socio-technical analysis of Urban Agriculture (UA) systems | - Desk research/ collecting data of CE references and UA systems<br>- Interviews with local stakeholders<br>- Participation in policy maker events | - Principles and models of CE practices<br>- Project alignment with CE regulations and goals from European Commission<br>- Mapping of local initiatives related to CE and food cycle systems in Poblenou/ Barcelona Stakeholder mapping of local food cycles<br>- Timeline of the mapping process | 50 | The richness of the local context exploration has permitted to extend our perimeter of actions and envision new possibilities for the project. The effort to use field analysis and systemic design tools to help us understand the interdependence between actors and scales letting us in new area of knowledge with more complexities than expected. |
| Phase 2 | 2.1 Recruitment<br>2.2 Raising and exchanging knowledge<br>2.3 Framing opportunities | - Data analysis<br>- Co-creation workshop (Synergy Soup) New synergy design tool<br>- Use of canvas to identify local synergies<br>- Communication plan | - Plan of activities in an iterative process<br>- Stakeholder engagement<br>- List of 31 project proposals to develop locally<br>- Dissemination and broad interaction during the Open Day Exhibition | 44 | Behind the abundance of contacts and learning, reframing the problem has consisted of taking time to exchange within the internal team. The effective use of design activities allowed the creation of connections between concepts, stakeholders, and discourse. A permanent effort to learn and anticipate future activities that fit with the objectives. Additionally, a stakeholder mapping of local food cycles was created based on the initiatives identified over the first phase. |
| Phase 3 | 3.1 Community events<br>3.2 Refining and selecting concepts<br>3.3 Planning the next steps | Redesigned tools: 6Ws,<br>Back casting-value opportunity mapping,<br>Idea card,<br>Eco-design and scenario building tools<br>Design tools for conviviality<br>- Learn by doing experiences | - Six ideas of projects were selected and developed in terms of necessity and possibilities<br>- Practical knowledge transfer about biomaterials and basic digital fabrication<br>- Definition of proposed solution | 120<br>54 forms<br>120<br>if +all events | We have changed the initial concept of maker challenge. We organised an open call for projects during one month with a set of events for both learning and co-creation activities in order to build a community. Following the Synergy Soup with strategic stakeholders, Fab Lab Bcn proposed one ideation session event, two learning experiences and one eco-design and scenario building event and a collective assessment. The engagement were heterogeneous according to the event. Most successful one were the community ideation workshop and biomaterial learning by doing workshop. |

*Table 10 Fab Lab Bcn Stakeholder engagement*

| Type of Stakeholders | Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|---|
| | | Co-producing | Co-designing | Consulted | Informed | |
| Local food communities | Cooperatives of food consumption | ☐ | ☒ | ☒ | ☒ | Members of cooperatives participated providing ideas and needs to support the construction of a circular neighbourhood taking into account the existing local resources. First connections were complex but facilitated by three main contacts. |
| | Urban gardens | ☐ | ☒ | ☒ | ☒ | Representatives of urban gardens contributed with ideas of infrastructure necessary for the spaces as well as techniques of composting in order to valorize the local biowaste. It was also offered as possible physical spaces to carry out experiments. Variety of form of engagement – Interested but need to find a form of reciprocity. |
| | Growstack – open source community of vertical farming | ☐ | ☐ | ☒ | ☐ | Members of the Growstack community afforded valuable possibilities to implement biowaste as new materials for vertical farming systems and improve the sustainability of existing models. Their role was less important than expected. |
| | Valldaura Lab | ☐ | ☐ | ☒ | ☐ | Great perceptions were provided of innovation potentials in soil-less agriculture, logistics for urban and peri-urban systems, potential of bio-materials in cities, using Fablabs as a place to learn, process and connect. Possible innovations for small farms and urban gardens were also discussed. |
| Makers and students | Fab Lab IAAC | ☒ | ☒ | ☒ | ☒ | Students and researchers have participated during the co-creation activities, giving insights of previous experiences with community projects (Making Sense EU Project, for instance). |
| | Macus Cooperative | ☐ | ☒ | ☒ | ☒ | Macus Cooperative has been actively involved over the co-creation workshops and learning experience activities since they have particular interests on developing local projects collaboratively. One of the members was the facilitator for the introduction to digital fabrication workshop. |
| Poblenou ecosystem | Local restaurants and markets | ☒ | ☒ | ☒ | ☒ | Interview of 5 restaurants and active participation over the experimentation phase and learning experience workshops. The restaurants collaborated providing selected bio-waste, which were used for innovation research and application They also participated providing catering for events. There was a heterogeneous engagement of restaurants, since some of them have just been informed about the project and others were more engaged, participating in the collection of biomaterials or events. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Local associations | ☐ | ☒ | ☐ | ☒ | Local Associations were connected in order to have a systemic view of previous and ongoing actions related to the local food system. A great collaboration was constructed to disseminate the pilot and use the public spaces in the neighbourhood. Need to be reinforced. |
| | Small companies | ☐ | ☒ | ☒ | ☐ | Small companies were interested to be in contact with local actors, addressing pressing environmental issues related to food systems. |
| | Residents | ☐ | ☒ | ☐ | ☒ | Several residents of Poblenou were actively involved over the activities in order to get knowledge about innovative solutions to apply in the neighbourhood. |
| | Existing social projects related to food | ☐ | ☒ | ☐ | ☐ | Existing local projects such as Taca D'oli and Bac Cuinetes offered a significant influence for the proposed solution decision as a result of their high social inclusion for circular solutions. |
| Technology and Research centres | Fab City Research Lab | ☒ | ☐ | ☐ | ☐ | The Fab research team has been supporting the pilot with previous experience about community challenge interventions, sharing tools, methods and giving feedbacks on the co-creation activities. |
| | ICTA – Political Ecology, Industrial | ☐ | ☐ | ☒ | ☐ | Research groups of ICTA have been contacted to exchange information and experiences of projects and studies, getting a more academic and research view of the methods applied during the pilot development. Collaboration for one event. |
| | Design Schools (BAU, ELISAVA and libraries, MATERIOM) | ☐ | ☐ | ☒ | ☐ | Design Schools were consulted in terms of reference materials to inspire the learning experiences. Specially, MATERIOM as a research group provided open data on how to make materials that nourish local economies and ecologies. Need to reinforce the connexion with material designers. |
| | External researchers (RMIT, ESTIA) | ☐ | ☒ | ☐ | ☐ | External researcher's experiences were considered to improve the possibilities of action research and co-design experiments within the pilot. |
| Policy Makers | Barcelona Activa | ☐ | ☐ | ☒ | ☐ | Barcelona Activa was consulted to align the project with ongoing initiatives. They agreed in collaborate on further dissemination of the activities. |
| | 22@ and Poblenou Urban District | ☐ | ☐ | ☒ | ☐ | 22@ is an initiative of the City Council of Barcelona that foster the innovative production into the district. Members of Scrap Store 22 @, which will start to promote the circular economy in the district |
| | Social economy and responsible consumption | ☐ | ☒ | ☒ | ☐ | Different members of the department of social economy were met. They orientate us toward ongoing projects, events and initiatives and connect with other relevant existing ones. Potential collaboration need to be explored. The team collaborate on one specific call "Enfortim". |

# POLIFACTORY

## Exploring

## Health & Wealth of young stroke survivors innovation

## 2. Polifactory's journey

POLIFACTORY's pilot project intends to explore the potential of co-design and user innovation by investigating the physical-motor needs of children diagnosed with cerebral palsy based on the principles of proprioception (definition below) with specific attention to the translation of movement in sound stimuli.

- PROCESS

We have selected the patient association FightTheStroke (FTS) as the most suitable to be involved in the pilot. FTS works for and with children diagnosed with cerebral palsy and of course with their parents.

Together with FTS it was decided to work on the relationship between music and movement to explore the physical aspects of music starting from the principles of proprioception.

After this first definition of the design challenge with the FTS association, we developed an online questionnaire, whose answers served to deepen the activities and needs of children diagnosed with cerebral palsy and their families and formed a first database used by POLIFACTORY to organize the sessions of co-design and experimentation.

We have conducted:

- two co-design sessions with caregivers (parents of children);
- an experimental laboratory with patients (children)
- a public presentation of our pilot project

- THE SELECTED SOLUTION

BODYSOUND is a system of motor stimulation of the limbs based on the transformation of movement into sound. Within a sensorized room, children can move (either following instructions or freestyle) and transform their movement into sounds (or melodies). The room is able to detect the child's movement and to send, through a wearable device, a haptic feedback to guide him/her in the "right" execution of the movement.

The solution identified proposes the possibility to create inclusive spaces and activities which are not directly connected to rehabilitation and therapy. The idea is to exploit a playful activity to encourage movement.

## 2.1. POLIFACTORY's journey implementation

### 2.1.1. Phase 1: Analyzing the context

- Process and methodology

POLIFACTORY decided to explore the potential of co-design in health and wealth ecosystems. The first necessary step was the identification of the main stakeholder. Therefore, we identified the patient association to collaborate with according to a series of characteristics which we considered as very important: representativeness (type of pathology and number of patients represented), operability (local action capacity and distribution throughout the country), experience (participation in previous co-creation initiatives), motivation (commitment and effort).

Face to face meetings were very important in the definition of our challenge. Indeed, we were in a constant dialogue with the patient association's president, which was crucial in order to frame (and re-frame) the challenge identifying a specific area of interest, actors, and stakeholders.

In the meantime, we carried out a literature review concerning co-design in healthcare and research of inspiring case studies within the field. In addition, when the challenge was more defined, we carried out several moments of exchange with design, engineering and business experts (which obviously also continued during the second phase).

We developed a co-design journey mind map in order to make our process clear both to us, to our stakeholders, and also to the rest of the SISCODE partners.

- Main outputs and results

Fun, and general quality of life of children with cerebral palsy cannot be underestimated. As Dr. Peter Rosenbaum (from CanChild Association) states "It's been a very long road, but the focus is now 'functioning' rather than 'fixing'. Nowadays, we promote the idea of the best life possible being the best medicine for people with cerebral palsy" (https://worldcpday.org/our-campaign/medical-therapeutic/dr-peter-rosenbaum-the-best-life-is-the-best-medicine-for-people-with-cerebral-palsy/).

Music and movement are obviously strictly connected; we wanted to explore the physical aspects of music starting from proprioception principles; proprioception is defined as the set of functions which control the position and movement of the body, based on information collected by peripheral receptors called proprioceptors. Such information is processed within spinal reflexes aimed at maintaining a correct posture and counteracting the force of gravity.

The process of our co-creation journey which we follow and planned can be found in the mind map (see Annex II p. 15).

We identified several labs and international initiatives of co-creation developed inside universities or research centres which worked or have been working on co-creation and healthcare (e.g. UCL Centre for Co-production in Health Research, Lab4Living, DHW Lab - Design for Health and Wellbeing Lab Project, etc.). However, it is less common that these two topics were explicitly connected with policy. At the moment, we found only one case study developed in Finland, which was very inspiring (Svensson and Hartmann, 2018).

FightTheStroke (FTS) was the patients' association which we identified as the right partner to involve in our journey. FTS works for and with children affected by cerebral palsy and their parents. Clinical records show that 2 to 2.5 per 1000 new-borns and children are affected by cerebral palsy (CP); 17 million people across the world live with cerebral palsy; 350 million people are closely connected to a child or adult with CP. It is the most common physical disability in childhood and it is a permanent disability that affects movement (at different levels) (www.worldcpday.org).

Thanks to several moments of exchange with the president of FTS, we verified the accuracy of our assumptions, also according to legal, bureaucratic and professional constraints (e.g. we cannot work on the development of healthcare products which needed a series of certifications which we cannot

obtain in time for the development of the challenge). We decided to work on sports and play, focusing in particular on music; this choice was due both because of the previously mentioned limitation but also because as the The International Classification of Functioning, Disability and Health (ICF) from the World Health Organization, states that "a true and effective global takeover of the child must give importance to a series of factors, described through six simple words, the so-called 6 F-Words: function , family, fitness, fun, friends, future".

*Table 11 of synthesis Polifactory*

| | |
|---|---|
| Theme | Health & Wealth of young stroke survivors. |
| Needs | Cerebral palsy, of which stroke is one of the possible causes, is the most common physical disability in childhood and it is a permanent disability that affects movement (at different levels). For this reason, we decided to focus on physical needs of children also in order to support their caregivers. |
| Key evidences | HEALTHCARE & MAKING<br>• There are several international initiatives of co-creation developed inside universities or research centres which work on co-creation and healthcare. However, it is less common that these two topics were explicitly connected with policy making;<br>• Fab City network, which POLIFACTORY is part of, explicitly makes reference to new possibilities of connection between urban ecosystems and the healthcare sector in order to involve final users, caregivers, and therapist in the design process.<br>USERS<br>• 2 to 2.5 per 1000 new-borns and children are affected by cerebral palsy (stroke is one of the possible causes for this condition);<br>• 17 million people across the world live with cerebral palsy (CP);<br>• 350 million people are closely connected to a child or adult with CP.<br>STARTING THE PROCESS<br>• Due to the sensitiveness of the topic we had to spend quite long time in explaining the purpose of the project in order to convince and involve possible stakeholders.<br>• Visualize our process was very useful in order to "see" the main issues and possibilities all together.<br>OUR FOCUS<br>• Deficits in the proprioceptive function have been in children diagnosed with cerebral palsy and this has a negative impact on their quality of daily life;<br>• Several studies demonstrated the importance of proprioception in the movements' coordination, in particular in individuals in severe sensory neuropathy conditions or surgery (Lee Hughes et al, 2015; Sarlegna et al., 2006; Messier et al., 2003);<br>• Proprioceptive sensory training can improve motor performance (Z. Bahadir Ağce et al., 2018;Cuppone et al., 2015; Casadio et al., 2009). |
| Main policy elements | In Italy, the healthcare policy system and service sector are mainly structured at a **regional level**. At the local level, we can also stress an increasingly widespread use of **co-design** and co-management practices. |

### 2.1.2. Phase 2: Reframing the problem

- Process and methodology

We planned:

- two co-design session with caregivers (parents of children);
- two experimentation labs with patients (children)
- a presentation to the public of our pilot project

In order to plan these moments, we continued our case-study research, looking for technological and medical solutions in rehabilitation and health improvement field, with special attention to stroke. In addition to that, we kept exchanging with the patient association' president and we also involved a design expert on sound and a group of IoT engineers.

At the same time, we implemented and sent out to caregivers, members of the patients' association, an online survey in order to better know our target.

We contacted a selected list of policy makers in order to understand their level of knowledge about co-design and gather from them information about policy making on issues related to our pilot project (health and wealth, innovation, entrepreneurship).

- Main outputs and results

Thanks to the desk research and the face to face meetings carried out with experts, we understood that several products and services already exist and could be used and tested as inspiration to envision our co-design session and the final solution. We acquired knowledge also on several music features and on the already existing design solutions for making music, amplifying and diffusing sounds through solid objects. Therefore, we identified four main technological and musical tools to develop simple tests to experiment with children: the Kinect technology, the Theremin, the Makey Makey, and SoundMoovz bracelets.

From the survey, we collected 71 answers (see annex p. 16) from all over Italy which helped us in gathering information about main problems, needs and impairments connected with the stroke and - in general- with a diagnose of cerebral palsy (we understood that stroke is just one possible cause of cerebral palsy). In addition to that, we got to know that:

- the most common problem is a reduced movement and coordination capacity;
- the most common deficits involve an arm, the equilibrium, a leg or both legs;
- these children feel comfortable at home and at school; instead they are not very comfortable when they go to treatment centers or hospitals;
- they attend both rehabilitation, sport and recreational activities (the least in smaller cases)
- the majority of respondents (parents) had never participated in co-design activity but the vast majority of them wanted to participate in our pilot project activity.

Some policy makers declared their interest, but they are still on process of answering our online form.

*Table 12 Polifactory key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| Patients association (FightTheStroke) | Support; Innovate; Share; Provide knowledge; Disseminate | Test a new "solution"; involve their associates; be in an international network |
| Caregivers and patients | Support; Feel good, safe, and comfortable; Improve; Have fun | Co-create a solution to improve their children movements and social life; Share their experience |
| Industry and innovation community | Experiment; Prototype; Earn | Support; Experiment |
| Scientific and research community (IoT Lab, DEIB) | Experiment; Innovate; Disseminate | Support; Experiment; Innovate |
| Policy makers | Support; Manage; Facilitate | Do not know yet |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 13 Polifactory Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | The former challenge was focus on "Health & Wealth of young stroke survivors". After several moment of discussion with both the president of the association and parents of children, who are members of the association, we understood that stoke is only one of the causes of cerebral palsy; therefore, we widened our focus including all children diagnosed with cerebral palsy. In addition to that, we also decide to address our attention more on wealth than on health because of bureaucratic constraints and on the Fs "fitness" and "fun" in connection with "function" (proposed by The International Classification of Functioning, Disability and Health from WHO). |
| Synthetic formulation of the reframed challenge. | According to what previously said, we named our challenge "BODYSOUND. Co-create innovative solutions to improve the movement of children with cerebral palsy". We specifically focus on music and movement (dance) in order to explore the physical perceptions of music. |

### 2.1.3. Phase 3: Envision alternatives

- Process and methodology

We carried out:

1. two co-design sessions with caregivers (parents of children);
2. two experimentation labs with patients (children)

We invited all the respondents to the questionnaire who expressed their interest in participating in the co-design activities developed within the project both from Lombardy and the rest of Italy. The first co-design session lasted 4 hours and it was organized in 4 main moments:

- Introduction. Quick presentation of POLIFACTORY and SISCODE, and we launched the brief.
- Needs. Starting from personal stories and the questionnaire's results, we identified both needs and design opportunities.
- Inspiration. We developed a set of inspiration cards composed by a selection of case studies particularly useful to understand technologic potentialities.
- Warm up + idea generation. Starting from a selection of some evocative images useful to recall: Scenarios / mood; Technologies; Devices, participants visualized some possible solutions.

At the end of the co-design session, the team had a debrief moment. After that, we ran an experimentation lab with children, composed by 4 different activities. Participants in both the co-design and experimentation lab were given a diary (cultural probes tool) where to take notes, express their opinions and ideas about the brief and the rehabilitation and recreational activities attended by their children.

Between the first and the second co-design and experimentation lab sessions the internal team conducted several debrief moments. The proposed solutions were verified also according to the already existing products and services; were then clustered according to 3 main design areas; the whole process was visualized and an initial check of their feasibility was conducted (more detail on the following section).

The second co-design session was dedicated to the participants from the first session. It lasted 2 hours and it was organized in 3 main moments:

- Feedback on the first co-design and experimentation lab session.
- Presentation of the general idea of the project and its basic components; there was space for discussion, which was guided using inspirational images selected according to 4 main areas of interest: device, sound, data, interface/movement guide.
- Realization of a collective storyboard in order to define the user experience.

The second experimentation lab with children was the same than the first one, but with new participants, as well.

- Main outputs and results

11 members of the association FTS participated in the first workshop (10 caregivers + 1 patient) supported by 4 designers from POLIFACTORY team.

The output of the first workshop were:

- 12 ideas
- 3 design areas

During the debrief, designers decided to combine several aspects of the ideas which emerged. The main characteristics identified for our solution were to:

- Make music through a bilateral movement; since children with cerebral palsy diagnosis tend to move only and preferably the side of their body which was not compromised
- Experience music through the body (wearables) thanks to haptic feedbacks
- Use of the body to play music

4 caregivers participated in the second co-design workshop. During this event, we verified both opinions on the first co-design workshop and experimentation lab. In addition to that, we presented them the idea which emerged from the debrief activity in order to verify and refine it. In particular, they appreciated the systematization of several ideas together and they were able to discuss about barriers and opportunities of the solution. We asked them to focus mainly on the device and on the guide for the movement. As the device is concerned, they suggested that it should be integrated in a piece of cloth or it should be an accessory which the child was able to wear by him/herself.

As the guide to the movement is concerned, participants identified Motion Graphic as the preferable solution; however, different opinions about the abstraction of the visualization emerged according mainly to the age and the physical and mental conditions of children.

In *Figure 7,* the collective storyboard is visualized. Participants could choose among different pre-identified solutions which the design team selected on the basis of the debrief process and propose them.

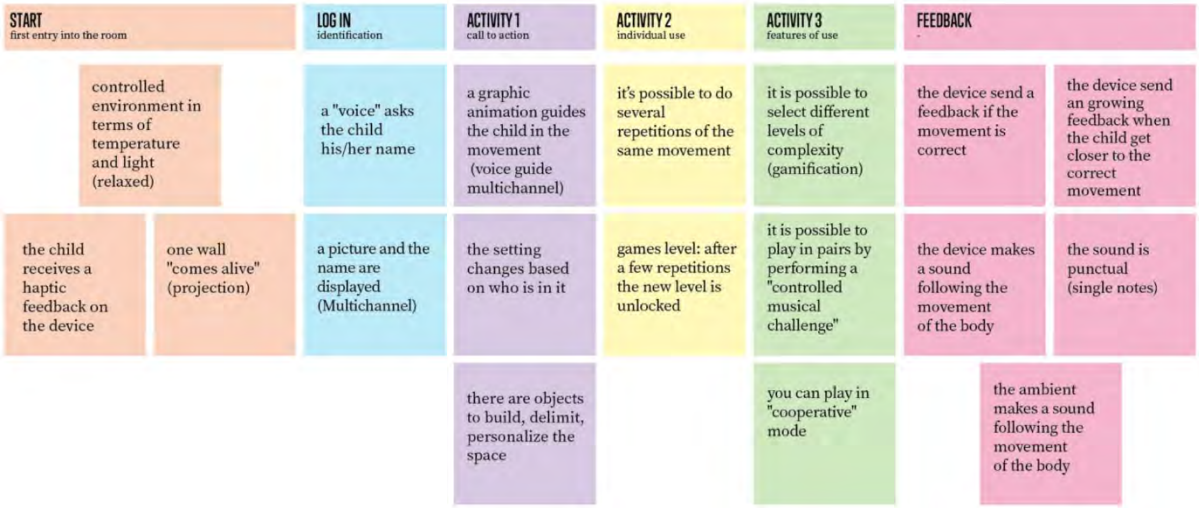



*Figure 7 Collective Storyboard*

In total 8 children participated in the experimentation lab and these are the main evidences collected:

- Shakeshake: parents really liked them because they are “portable”, can be used everywhere, and are easy to use;
- Teremì: easy to use; children like the sound produced;
- Gimmi5: easy to use also by little children;
- Kinny: not very intuitive and easy to use, but when they understand how to do it, they like it; Kinect has difficulties in detecting children on wheelchair.

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project. We selected only 7 ideas to present according to their relevance in the final solution which we identified.

*Table 14 Polifactory ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities - | |
|---|---|---|---|---|
| "Virtual dj" eye-control interface to make digital music | Patients in severe conditions: bilateral quadriplegia | Eye-control system for recreational purposes. *Translate the ocular movement into sounds.* | Portability | - Small and very specific target<br>- No motor rehabilitation |
| Musical gloves<br>Wearable device which translates the hands residual movement into sounds | Patients who need to rehabilitate movements of precision | Tracking and monitoring IoT wearable device | - Portability<br>- "Musical" instrument for motor rehabilitation | - Weak motor rehabilitation<br>- Lack of innovation<br>- Exclusion of patients in severe conditions |
| PlayMe<br>App to make music which translates sounds in haptic feedbacks | Suitable for all the patients | Feel the sound through a wearable device | Device which could calm emotional burst episodes | - No motor rehabilitation |
| Me, sound conductor<br>Wearable device which allows to have a physical experience of music | Suitable for all the patients | Feel the sound as a tangible phenomenon | Portability | - Weak motor rehabilitation<br>- Lack of innovation |
| Wall game<br>Interactive game which gives physical feedbacks thanks to a wearable device | Suitable for patients who are not in severe conditions | Integration between the space/interior and the device | Gamification as a motivational boost | Exclusion of patients in severe conditions |
| The body as a musical instrument<br>Make music through the movement | Suitable for patients who are not in severe conditions | Motion capture for sounds | Music as a "device" for the motor reactivation | Exclusion of patients in severe conditions |
| Sound and body wall. Make music through the contact between the body and the space | Suitable for patients who can move at least the upper body | | - Multisensorial<br>- Multichannel | - Limited to the arms<br>- Exclusion of patients in severe conditions |

## 2.2. Solution: the selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| *BODYSOUND* |

# What?

BODYSOUND is a system of motor stimulation of the limbs based on the transformation of movement into sound. Within a sensorized room, children can move (either following instructions or freestyle) and transform their movement into sounds (or melodies). The room is able to detect the child's movement and to send, through a wearable device, a haptic feedback to guide him/her in the "right" execution of the movement.

The solution proposes a design frame which lacks explorative experiences: the possibility to create inclusive spaces and activities which are not directly connected to rehabilitation and therapy. The idea to exploit a playful activity to favor the movement.

**Type of prototypes:** product-service

# Why?

The solution exploits sound as a motivational and inclusive element; indeed, from one side it was thought for children affected by cerebral palsy, and therefore it will be based on a system of stimuli and exercises adapted for their needs (e.g. performance for both right and left hand (bimanuality), mirroring of movement, etc.); from the other side this solution can be used also by children which do not have this kind of pathology. Indeed, having fun (and not be bored), be challenged in a positive way, encounter other people (in this case children) can have very positive effects on their mood and somehow on physical improvements as well.

# How?

**Activities:** After the test a series of technologies during the body sound lab journey, we will develop a first prototype that relates the different elements of the system (environmental detection, haptic device feedback, movement guide and generated sound). In parallel we will try to test it to co-develop the children's user experience and validate the effectiveness of the chosen technology. At the same time, we will rely on the support of therapists to define the proper typologies of movements and the possibilities to customize the system based on the needs of different patients. We will develop a first version of the software that we will implement based on tests results.

**Main stakeholders and responsibilities:**

In phase 4, we are going to involve:

- Patients and caregivers, thanks to the support of the patients association FightTheStroke; we will contact again those who has already been involved in phase 3 but eventually also new participants. Parents and children will test and give feedbacks to several the prototyping phases.
- Experts; several typologies of experts will be involved. For the development of the prototype we are going to collaborate with designers and engineers; for the selection and the review of the medical accuracy of our solution, we are going to involve therapists.

- Policy makers; we are going to involve policy makers in order to evaluate the possibilities for the implementation of our solution and also to share with them co-design principles and tools.

**Budget:**

- Software: 1000€
- Hardware: 4000€
- Space: 1000€
- Development: 7000€ + sponsorship
- Other costs: 2000€

All these costs have to be verified and could change during the prototyping. We will also verify the possibility to create partnership and/or sponsorship.

**Data collection:**

1- Patients and caregivers; we are planning to have several co-prototyping and co-testing activities, focus groups, and diaries thanks to which collect opinions and suggestions. We might also organize online moments of confrontation, especially with parents who cannot participate in person to these activities (both calls and questionnaires). For example, we will discuss with them on the whole user experience, such as the typology of interaction, the wearable device features, the sound produced during the experience, the feedbacks received by the user, etc.

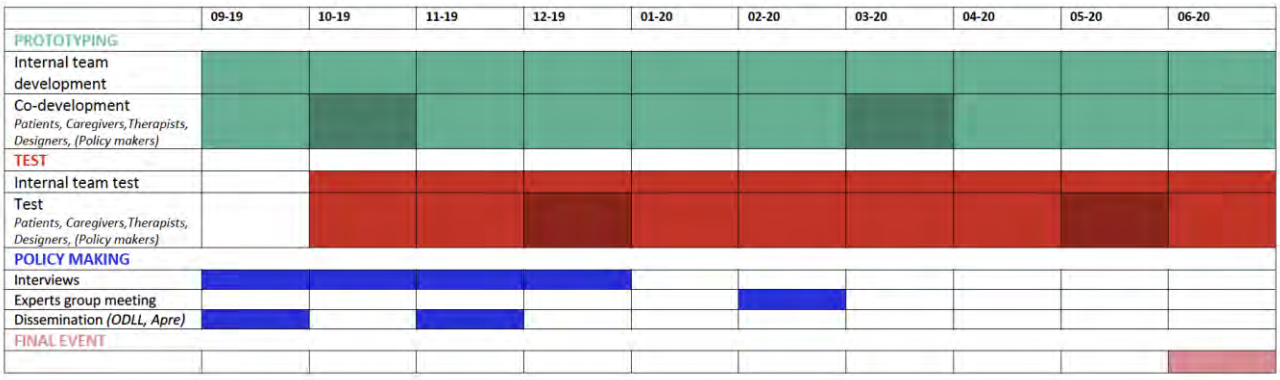
2- Therapists; we are going to organize face to face meetings in order to share with them our ideas and to verify these with them. These verification moments will occur along the whole prototyping process.

3- Policy makers; we are going to meet the local policy makers who declared to be interested in the project in person in order to understand with them what kind of implementation possibilities our solution might have (interviews/talks). In addition to that, we are planning to collaborate in the organization of a workshop at the national level.

# When?

**Duration:** September 2019-June 2020

**Time scope:**



# Comments

- The timing for the software development are not fully predictable yet ;
- The solution might be more expensive than expected ;
- We might encounter difficulties in involving Policy makers.

As the first two issues are concerned, we are identifying already developed software which are open to be used and hacked. This will allow to save time and money. In addition to that, we are also verifying the possibility to use resources (both in terms of competences, tools, and infrastructures, which are internal at the Politecnico di Milano.

As the involvement of Policy makers is concerned, we are developing a detailed agenda for the next period (September-June) in order to be able to engage them in advance and to give them a general overview of the process and goals which justify their involvement (see the following section).

Our solution will also serve as an experimentation for the possibility to develop in the future a closer and stronger relationship between the urban (fablabs) ecosystem and the healthcare sector, which was more accessible, customizable, local, and democratic as in the view of Fab City manifesto, which POLIFACTORY takes part in.

Please see Annex II p. 17-18 for the complete description of the Idea canvas and the Experimentation Canvases.

## 2.3. Policy Making in the implementation of the co-creation journey

Getting to know better the local political context. In 2014, Lombardy Region published the issue of the law of reorganization "**Evolution of the Lombardy socio-economic system**" (August 2015).

Lombardy Region founded the **Life Sciences Lombard Cluster**, which collects all the public and private actors committed with diagnostics, advanced therapies, pharmaceuticals, medical devices and technologies applied to health, to better facilitate the progress of life sciences in Lombardy and the creation of new business opportunities among the members.

In Lombardy experiences of **community welfare** were carried out thanks to the program financed by Fondazione Cariplo with the tender called Welfare in Action.

At the municipal level, **Milano** is focusing very much on making the city a so-called **Sharing City**, which it is defined as "an ecosystem where the different actors are solution holders in a virtuous process of **co-design**, **co-development**, and **co-management** of practices, spaces, goods, and services".

In addition to that, from other recent piece of research carried out by POLIFACTORY, was stressed that patient's scale-up innovation is both an economic and political challenge. The two aspects are very much connected because the regulatory and process certification processes take very long periods of time (Maffei et al, 2019 – available at https://www.maketocare.it/-/media/EMS/Conditions/RareDiseases/Brands/Maketocare-IT/ReportMTC2_2019.pdf?h=).

- Policy Gaps and suggestions

*Table 15 Polifactory: about the policy gaps and suggestions:*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Governance levels (we act locally but policies are regionally-nationally organized). Absence of specialized public innovation networks. | In general, a multi-level approach is needed both in terms of:<br>• contents<br>• competences<br>• stakeholders<br>A multi-level strategy, related to healthcare innovation, should favour the connection and the collaboration between the three levels, acquiring - as well - a deeper knowledge on "informal" innovators (patients and caregivers) and supporting them with the right medical, technical, and financial capabilities. To do that, it would be very important to empower the role of possible competence centers (e.g. universities, fab lab, enterprises). |
| Need for empowering of collaboration among different public actors to build a public innovation model. Need to connect the private sector initiatives | |
| There are no specific funds for developing innovation's initiatives (even the grassroot's ones) in favour of/developed by patients, caregivers or patients associations. | |
| Not clear certification process that generates a not effective, transparent and supportive Financing and Consulting system. | |

- Engagement with policy makers

We have made a list of policy makers that we potentially could involve, according to the sector they worked in and their role. For example, we contacted the Municipality of Milan: the President of the commission for Social Policies, Health Services and Volunteering; the Councilor for Participation, Active Citizenship and Open Data; etc. From Lombardy Region: the DG Productive Activities, Research and Innovation; the Councilor for Welfare; etc. We also contacted some delegates from the Chamber of Commerce.

- We invited them to the open presentation of our pilot project ;
- We sent them an online form which was built around the "Challenge: Policy Context" card proposed by SISCODE;
- We sent them a report about the results obtained by the co-creation workshops and the experimentation lab.

- Future actions and suggestions for WP4 workshops

We decided to involve policy makers in one to one interviews and conversations: These experts' conversations might enable trust and understanding which might help further collaborations. In addition to that, we plan to have a collective moment with them during which sharing ideas and suggestions on "how to" start a policy initiative about patient innovation. Moreover, policy makers will be invited to participate in all the co-development and test workshops which we will held from September until June.
As dissemination activities:

- We are going to participate in OLLD (Open Living Lab Days) collaborating in the organization of the workshop "Co-creating by other means: bridging the gap between experimentation and policymaking in Science and Technology Innovation" (Thessaloniki, 3-5 September 2019)
- We are planning to be involved in the National WS with Policymakers organized by APRE

We think that these collective moments of debate are very important especially at a National level since, as we stressed, policy about healthcare innovation are managed at a Regional and National level.

## 2.4. **Monitoring of the process**

*Table 16 Polifactory Synthesis of the activities*

| | Effective Activity | Tools | Output | Nb | Comments (any changes to D3.1 ?) |
|---|---|---|---|---|---|
| **Phase 1** | **1.1** Desk Research<br>**1.2** Stakeholder identification<br>**1.3** Synthetize and analyse data | **1.1:** Articles, papers (Google scholar, Research Gate); Case study research (Google scholar, Specialized magazines, web…)<br>**1.2:** Meeting (in person), skype, appear, e-mail<br>**1.3:** Mental Map (Adobe Illustrator) | **1.1:** knowledge about other piece research; identification of several labs working on these issues and of solutions which used advanced technologies for rehabilitation and sport purposes.<br>**1.2:** Selection of the patients' association and consultation with other stakeholders.<br>**1.3:** Visualization of the whole process | **10** | We added the survey activities to our process |
| **Phase 2** | **2.1** Reasoning with analysis of the context<br>**2.2** Innovation Challenge Design | **2.1** Case study research (Google scholar, Specialized magazines, web,…); Survey (Google form)<br>**2.2** Meeting in person and on appear | **2.1** identification of technological and medical solutions in stroke, rehabilitation, sports and leisure fields; knowledge of patient's needs; first contact with policy makers<br>**2.2** co-design of the challenge definition | **2.1** 90<br>**2.2.** 8 | We did not carry out co-design workshops but we had several consultations with various stakeholders and experts |
| **Phase 3** | **3.1** Innovation Challenge Design conduction (ideas generation)<br>**3.2** Innovation Challenge Design conduction (ideas selection) | **3.1:** Co-design workshop (narratives, inspiration cards, evocative images, idea generation card; Technology experimentation (sound bracelets, theremin, makey makey, Kinect); Open event (ppt presentation).<br>**3.2:** Debrief (review of the materials collected, discussion, reporting); Co-design workshops (collective guided discussion, collective storyboard)<br>**3.1+3.2:** diaries (cultural probes) | **3.1** 12 ideas; 3 design areas; testing different technologies and acquisition of information about children reactions to them; dissemination<br>**3.2:** 1 final solution;<br>**3.1+3.2:** feedbacks on previous activities, description of rehabilitation, leisure and sports activities (carried out by children), inspiration for the solution. | **25** | We improved our process with the organization of a technology experimentation and with the use of diaries (cultural probes) |

*Table 17 Polifactory Stakeholder engagement*

| Type of Stakeholders | Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|---|
| | | Co-producing | Co-designing | Consulted | Informed | |
| Patients and caregivers | Association FTS (President) | ☐ | ☒ | ☒ | ☐ | The participation of the President of the association was very important for the definition of the challenge |
| | Caregivers | ☐ | ☒ | ☒ | ☐ | Very involved and committed |
| | Patients | ☐ | ☒ | ☐ | ☐ | Important to observe and to create a relationship also with the children |
| Policy makers | | ☐ | ☐ | ☒ | ☒ | We could only have initial conversations with them. We are going to deepen the relationship in the following months, during the prototyping phase |
| Business companies | | ☐ | ☐ | ☒ | ☒ | We consulted in particular two of them: one for the development of the software and the other for the wearable devices. However, we will evaluate their engagement in the future because of Open Innovation issues |
| Scientific & Research communities (IoT Lab, DEIB) | | ☐ | ☒ | ☒ | ☒ | We could consult and work with experts from Politecnico di Milano in order to verify technological possibilities |

# UNDERBROEN

## Exploring

Circular Economy, Local Production, Circular material flows, Plastic economy, systemic innovation,, material innovation

## 3. Underbroen's Journey

Our challenge addresses the lack of local and economically accessible facilities, technologies to, as well as incitement and knowhow on local recycling of plastic waste in Copenhagen. The challenge meets a need for circular systemic innovation and holistic production models for recycling plastics that take the whole model chain - from local generators of waste plastic to end-buyers of locally produced goods - into consideration in a way that is economically viable and scalable. With a strong starting point in the local maker and Fablab communities we have focused our co-creation journey on the main target group of micro entrepreneurs and small-scale manufacturers in Copenhagen, as well as local generators of plastic waste: SMEs and manufacturers. We have focused on understanding their needs and current pains, production and business models, concluding that a solution that combines a desire to reduce, reuse and recycle in manufacturing, production and consumption is achieved through a locally anchored systemic approach, currently blocked by lack of access to viable recycling services, facilities, technologies and economically viable and attractive alternatives to the cities' waste management system. We have mapped and analysed the local systems, existing and possible solutions, best practice in equipment use and production models, as well as legislations and regulations in hardware production.

Our conclusions pointed toward a locally based service to produce building materials of recycled plastic, on demand, in a small to medium production scale, offered to local product designers and manufacturers of products, projects and goods. We concluded the necessity to transition from existing 'Do-It-Yourself' and hobbyist technological solutions to plastic recycling to either equipment of a semi-industrial standard in a coop production system or to seek out small scale industry collaboration. This is a necessary transition in order to service the identified demand, to meet legislation and certifications, as well as our target groups' demands to quality and quantity.

Since our challenge is to meet a local demand recycled plastic building materials in a sustainable quantity and quality, we envisioned the solution as a - starting from scratch in Copenhagen - local stakeholder system and production model for sourcing and recycling plastic waste into new building materials in a local, circular system. On this basis we have developed and got feedback on a conceptual system model built around generic stakeholder groups in five function based categories: *generators of waste*, *processors of waste*, *producers demanding locally sourced recycled materials*, *resellers of recycled products and goods, and finally end-buyers - the latter later got conceptualised as 'micro generators' of plastic*. We have conducted various workshops, Open Lab Days, meetings and field trips to seek out potential local solutions and have worked on conceptualising ideal and necessary logistics, collaborative models and work processes that bind together the five core functions in the systemic model.

## 3.1. Maker's journey implementation

### 3.1.1. Phase 1: Analysing the context

- Process and methodology

We have researched and mapped knowledge on and solutions in circular economy, related technologies and systems, best practices in recycling, system models and the local stakeholder landscape, local, national and European policies/legislation and finally engaged a local and invested core of initial stakeholders. Methods used have been desk research, reading publications, resource and stakeholder mapping, stakeholder and expert interviews and field visits.

We organized our desk research into two fields of interest: 1) circular economy solutions, production models and technologies, collaborative methods and practices in local, small to medium scale circular production and recycling, and 2) policy and policy making (i.e. the global plastic challenge, national and local legislation, strategies and plans, as well as EU initiatives and regulations). We generated search word typologies and created databases of valuable findings and initiatives throughout the research phase.

We have continuously researched, mapped and engaged local stakeholders and applied a 'snowballing' tactic, asking stakeholders who we should further engage and why. The initial core group consisted of stakeholders from the recycling and small-scale design/manufacturer categories, as well as strategic stakeholders counting the Danish founded NGO Plastic Change and policy makers from the Technical and Environmental department in Copenhagen. We have conducted informal interviews with 25-30 local stakeholders in the Generator, Processor and Producer categories, some one-on-one interviews, others as focus groups and workshops, involving mapping of challenges, business models, initial ideation, etc. In parallel we have been informing local policy and decision makers, one of them in a meeting with the Mayor of Culture and Leisure.

- Main outputs and results

In phase 1 we have developed a deep understanding of the infrastructural and organizational local and generic challenges and potentials in developing a small-scale prototype of a local plastic recycling system. In collaboration with our initial core stakeholder group we have iterated a blueprint of a supply chain system, building on our "Draft of a local cradle-to-cradle system model", conceptualized system functions and mapped identified and new stakeholders in recycling of three fractions (plastics, wood and textiles). Through this process we concluded that the successful management of three parallel co-creation processes (one for each identified fraction) and related stakeholder networks with the time scope and resources at our disposition was too risky and big of a task. In dialogue with our stakeholders we decided that it was better to prototype a system for a single fraction, and build on knowledge from this first prototype in future material fractions. We then decided to only focus on plastics, since this was the system with most involved stakeholders, and kept developing the blueprint for a circular plastic production system based on stakeholders. From desk research and context analysis we gained needed insights in the overall plastic challenge (globally and locally), models for recirculation of materials in cities, circular economy framework that has helped qualify, broaden and focus the co-creation process, as well as relevant local stakeholders. (See Annex II p. 20 for examples)

*Table 18 Synthesis UNDERBROEN*

| | |
|---|---|
| **Theme** | Circular Economy, Local Production, Circular material flows, plastic economy, systemic innovation, material innovation, recycle, reuse, small scale designers/micro entrepreneurs (makers) |
| **Needs** | Need for reliable and industrial standard machines to manufacture and scale plastic recycling and models for access to such facilities in the target group. A need for practical application of existing policy initiatives between the local community of makers and small-scale manufacturers, the plastic industry and the City as well as alternative solutions. Monetary incentives to encourage sorting and prevent incineration in the existing waste management system. Policy need for interdisciplinary initiatives, methodologies and knowledge. |
| **Key evidences** | No local, nor accessible production equipment available to small scale manufacturers. No local recycling facilities in the region of Zealand who produce sheets from recycled plastic. None of the stakeholder have the necessary resources, nor knowhow, to establish or operate a local recycling solution. Stakeholders in the Producer category have expressed interest to work with locally recycled materials and develop their business models. The larger part of SME owners don't have waste management plans and use the municipal recycling solutions against payment, many of them not sorting. The recent Resource and Management Plan (City of Copenhagen) highlights the ambition to reduce CO2 footprint and decrease incineration drastically. Local citizens are good at sorting waste. |
| **Main policy context elements** | *Local level*: establishing a resource innovation lab to test and experiment with circular economy, a strategy to gather 70% of all household and SME waste and waste for recycling and reuse in 2024, a plan to support the development of circular material flows in collaboration with local businesses, emphasize on the need for quality recycled materials, business models and holistic value chains for sustainable circular economy solutions, 2019-2022 procurement strategy to purchase goods for their own institutions for approx. €1.5M (2017) with the potential of inscribing regulations that support the local market for circular products and new solutions.<br><br>*National/European policy levels:* the recently elected government's climate goals to reduce national carbon emission by 70% by 2030 and net 0-emission by 2050. New EU waste rules per April 2018 in alignment with the Circular Economy Action Plan with recycling targets for municipal waste and waste streams, and Extended Producer Responsibility (EPR) schemes to be implemented by 2025. |

### 3.1.2. Phase 2: Reframing the problem

- Process and methodology

We have conducted workshops, stakeholder meetings, informal interviews, Maker Meet Ups (network events), informing activities and briefs to reframe the challenge and engage more stakeholders. We have informed local policy makers via emails, local events and meetings, and engaged city administration officers in local co-creation activities as experts, speakers and participants. At our Maker Meet Up/Stakeholder workshop an innovation officer from the Technological and Environmental Department presented City of Copenhagen's strategy to circular economy that was then debated among the 27 participants. We have facilitated various community workshops and circular economy briefs to engage designers to learn from their experiences and to keep the designers and makers in the centre of the challenge. Here, we learned that knowledge and training in circular economy and sustainable design/production practices was a big part of the challenge and coming solution. We have collaborated with a group of Sustainable Design students from Aalborg University CPH on workshops on material life cycle analysis, stakeholder mapping in a circular loop and circular business models from an Actor-Network Theory methodology.

We have organized field visits to different stakeholders, including the medium sized business and waste generator MatKon, visits to the makerspaces and 10 Fablabs in Copenhagen, and the three workshops of the Danish Technical University (DTU), bringing key stakeholders along to develop shared experience. We used idea cards, business model canvases, geographical mapping, Actor Network theory models (OPP – Obligatory Passage Point and Graphical syntaxes) and brainstorming to understand stakeholder needs, existing resources, experiences and production models in reframing the problem. (See Annex II p. 21 for examples)

- Main outputs and results

Through continuous stakeholder mapping and co-creation activities we have concluded that there are many local stakeholders, in the different functions of the drafted system model, interested in and able to take part in the conceptualization and prototyping phases, as well as making upscaling more likely after the SISCODE project. This has supported our initial idea of a coop governance model where labour is distributed among various stakeholder groups and roles.

We have conducted simplified life cycle analysis prospective (i.e. analysing ecological foot print of existing relevant building materials and compared them to the prospective locally recycled material) and concluded that in many ways, local and circular plastic recycling is a better alternative to industrial virgin plastic building materials, as well as recycled, imported alternatives. However, the local recycling of plastic still has a negative environmental impact. From this we concluded the absolute importance of developing principles and guidelines for "reduce, reuse, recycle" practices to prolong product life, as well as consumption principles to be further developed in the next phase. We have used idea cards, business model canvases, geographical mapping, actor network theory and brainstorming to understand our stakeholders needs, existing resources, experiences and production models in reframing the problem. Desk research, data collection and conclusions leading to the co-created and commonly acknowledged understanding of the challenge, its proportions and the extend of potential solutions has led to the decision that we will only focus on plastic waste, and primarily from the SME category, e.g. plastic waste generated from local SMEs and manufacturers. (See Annex II p. 22 for examples)

*Table 19 Underbroen key stakeholders?*

| | | |
|---|---|---|
| BetaLab / BetaFactory | Run makerspaces in Copenhagen, help makers scale their projects and business, design and product development, local and digital production. | To be part of design prototyping and model prototyping. To be part of the future scaled model. |
| Von Plast | Educate citizens, micro entrepreneurs and SMEs on plastic recycling. Act as a processor in the local system. | To be part of finding solutions for a circular system model for recycled plastic and to develop their business model in order to scale. |
| ChipChop, SILK Design Studio, Nils-Ole Zip (microentrepreneurs) | Produce locally sourced, sustainable products and goods. Develop their business and production to local sourcing of materials and extended producer responsibility commitments. | Development of product prototypes for assessment of quality. Access to the recycled building materials at a competitive price with the potential of quoting/ordering specific products. |
| AAU | Improve circular design models and processes using their knowledge and expertise on production systems and environmental impact, etc. | To work with a real-life case in Life Cycle Analysis, stakeholder mapping and circular business models. |
| Techn. and Environmental Dep. (City of Copenhagen) | Gain insights on how to support and establish innovative circular economy solutions. | To gain access to our results for possible upscaling and policy making. |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 20 Underbroen challenge synthesis*

| | |
|---|---|
| What was the former challenge? | How can the City of Copenhagen become more circular regarding material flows and utilization, local design and production, and do it in a collaborative way that empowers both makers, designers, companies and municipal initiatives in creating ecosystems and supply chains for recycling materials such as plastic, wood and textile? |
| Synthetic formulation of the reframed challenge. | How can local micro entrepreneurs, SMEs, commercial resellers and citizens collaborate in a circular system plastic recycling production model in Copenhagen? What facilities, systems and workflows are needed for the recirculation of local materials? How to scale and ensure high quality and steady material supply of recycled building materials and goods, and promote a transition towards more sustainable production and consumption in Copenhagen from a bottom-up perspective? |

### 3.1.3. **Phase 3: Envision alternatives**

- Process and methodology

We have continuously discussed possible solutions with the local Producers and engaged SME Generators in our findings and ideation. We identified necessary technological equipment for a processing facility and researched relevant machines and tools needed in the Processing and Production stages. The Life Cycle Analysis was finished and was used in a workshop to understand the contexts, refining concepts and selecting ideas. Finally, following a field visit and expert interview with the chairman of Aage Vestergaard Larsen (Danish industrial plastic recycling company) we acquired knowledge to possible solutions and begun planning the prototyping phase. We produced and presented a draft on a "Circular Design Brief" build on previous results and outputs to address the need for training and knowhow on material/production knowledge (e.g. quality, knowledge on materials, material flows and life cycle analysis), We tested the brief on students from a local folk high school and challenged them to design with circular and sustainability principles. From their feedback, we concluded that training and briefs are a powerful tool in training and promoting best practices among Producers. We concluded that we will make training and introduction courses for all stakeholder categories in the system. We have widened the target group to engage regular citizens as potential end-users and micro generators, but also to engage with policy makers on envisioning the solution. We invited citizens to give feedback on existing solutions alternatives and a recycling workshop with our core stakeholders, Von Plast and one new stakeholder project, CIDE Lab (see below), where we did a small simulation of the system and engaged citizens recycling and how bottom up and open source approached can benefit the global and local plastic challenge. We also organized a Maker Meet Up (stakeholder workshop at Underbroen) where we invited our core stakeholder group, as well as policy makers from the Department of Technology and Environment, a spokesperson from the Environmental NGO Plastic Change and the founder of CIDE Lab to present their ideas, challenges and solutions to be discussed in groups among the participants. (See Annex II p. 21 for examples and pictures from activities).

- Main outputs and results

We got to the conclusion that there are no existing facilities or machines - only stakeholders willing - to take on the processing function of the system model and that the best available prototyping strategy was to do an initial small scale prototype of the Processor function at Underbroen to acquire first and necessary results to further unfold and implement the solution. In Phase 3 phase we lost a key generator/processor stakeholder (MatKon). Over several development meetings we experienced a lack of interest in sharing resources and results and decided to stop our collaboration. In the same period, a new stakeholder emerged with a wish to establish 'Circular Design Lab' (CIDE Lab) in Cph to process and research circular economy on a small-to-medium scale. CIDE Lab is a key stakeholder in the prototype phase and the main stakeholder in the Processor prototype. Our results will feed into their project conceptualization and constitution, building of a business case and funding activities. Highlights from the material flow analysis point to the fact that establishing a local solution to produce high quality recycled plastic building materials will benefit the local environment, and compared to imported recycled plastic products, the CO2 footprint is significantly lower. Our field trip to Aage Vestergaard Larsen gave us knowledge on industrial plastic recycling that confirmed that our solution should be one that services small to medium scale manufacturers in Copenhagen, as there are already best practice solutions for large scale industrial recycling of plastics. (See Annex II p. 23 for examples).

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 21 Underbroen Ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Sourcing from private households | Micro Generators, the City of Copenhagen | Process | The municipality is already engaged in experimentation on solutions.<br><br>Greater transparency and incitement to recycle among citizens | Out of all fragments (private, commercial, industry) it is the smallest and, according to the municipality, least pressing in comparison to commercial and industrial fragments.<br>A difficult fragment to clean and sort process effectively + behavioural change |
| Material bank for recycled materials. Local database of plastic sources (processed and potential raw materials | Generators, Processors and Producers | database / platform | A system does not exist (local or global)<br><br>Shared interest with the City of Copenhagen, following their recent Waste Management Plan and circular economy policy initiatives + micro entrepreneurs | Who should build and administer the solution (i.e. the municipality, an organization or a private company - or a hybrid combination?) |
| Establishing a Circular Design Lab (CIDE Lab) - A local recycling and circular economy R&D unit | micro entrepreneurs and product manufacturers , SMEs, industry, Policy makers, maker community | Facility | No other initiatives are this ambitious about experimentation, testing and supporting local SMEs/manufacturers and product designers in circular transition.<br><br>This project shares the same values as in the local SISCODE challenge - *it has been born out of this co-creation project* | This future project is very ambitious, and therefore also relies on larger funding schemes.<br><br>The ambition to become financial sustainable by selling circular products, materials etc. is difficult (but feasible). |
| Circular production and design manuals + training (open source, sharing platform) | Local makers and designers + SMEs | Product | Good idea to utilize the scope of SISCODE to help local designers, makers and companies become more circular. | It might be a challenge to target all type of producers and designers, but we will focus on local independent makers and designers to begin with. |
| Recycled material catalogue and data | Local makers, designers + SMEs, the municipality + companies | Product | This is not present at the moment, but needed in the community. | Requires facilitation and maintenance - who will run this in the future? |
| Locally produced sheets of recycled plastic | Local makers and designers + SMEs | Product | Need for producing heets<br>Not possible to source such material locally in Denmark.<br>Feasible, but facilities to establish | Financial limits on buying machines etc. |

## 3.2. Solution: the selected idea and future steps

| *Name of your solution* |
| --- |
| 'Plastic In, Plastic Out' (PIPO) - Circular system for local sourcing, recycling and production of sustainable plastic building materials and products. |

# What?

PIPO is a production model and service system for sourcing and recycling plastics from local SME manufacturers to offer to micro entrepreneurs and small-scale product manufacturers in Copenhagen. The vision is to create a self-sustaining circular system built on local resources (human, material, technological and economic) and activities that promote responsible practice in design, manufacturing and consumption. PIPO engages various stakeholders actively in carrying out tasks of the circular system: from collecting plastic waste to producing new goods, and reclaiming products for recycling again based on five stakeholder functions generic to any city: 1) 'Generators' of plastic waste (SMEs/small scale manufacturers generating plastic waste as a bi-product), 2) 'Processors' (local facility/is with knowhow and equipment to turn plastic waste into recycled building material), 3) 'Producers' (micro entrepreneurs and small scale product manufacturers of locally produced goods), 4) 'Resellers' (a potential Producer/End-buyer intermediary), and finally 5) 'End-buyers/micro generators' (consumers of local goods that over time turn into 'micro generators' of plastic waste to be reintroduced into the circular production system). Lastly, our prototyping results will actively be exploited in the potential birthing of a new recycling facility and knowledge hub for circular economy in Copenhagen - Circular Design Lab (CIDE Lab).

# Why?

The overall need addressed is a global societal demand for sustainable solutions and circular alternatives to traditional production models, thus addressing challenges of resource scarcity, negative environmental impact of the traditional (linear) production models and lack of alternate models to manage and recycle waste, as well as changing consumption patterns from a triple bottom line and holistic approach (people, planet, profit). This need is one of great concern to citizens, policy makers (and the planet!). PIPO's proposed value is that of a new production model for design and manufacturing practices, as well as raising awareness and incitement to produce, consume and manage physical goods in more sustainable and responsible practices.

Over the past decade technologies for smart and small batch manufacturing has supported the growth of micro entrepreneurs, many of which are born out of the global makerspace and fab lab communities. Many of these actors are drivers of innovation in sustainable design and production (William Barrett et al., 2015, p. 4). We have identified a barrier in the lack of access to the necessary resources (economic, technological, knowhow, etc.) to pursue circular economy enterprises in this target group; an unmet need for accessible production facilities, services and equipment, as well as best practice models and knowhow in circular economy practices, such as material knowledge, knowhow and collaborative models in recycling, sourcing, as well as business cases to push global transformation.

There are no available local services or facilities to recycle and/or offer recycled building materials in Copenhagen or the Zealand region. Existing national and viable solutions are not in the price range of the target group. Existing local solutions do not live up to commercial standards, certifications or reliability to produce in a consistent quality or quantity. Existing recycled building materials come from abroad and lack material transparency, are in fact down cycled plastics, thus breaking the

principle of circularity. It is the ambition that PIPO will result in more plastic being recycled locally instead of transported to faraway recycling plants. Since we are sourcing plastic waste from SMEs and small-scale manufacturers it is our expectations that less material will end up at the recycling stations, potentially incinerated. It is our hope that results can serve as a model in developing more material fractions systems in Copenhagen. Last but not least, the implementation of and results of PIPO will hopefully support the establishment of a permanent circular economy production facility and knowledge hub in Copenhagen (CIDE Lab). We provide new market opportunities for local micro entrepreneurs, SMEs and manufacturers, as well as sustainable alternatives for local plastic waste generators and end-buyers. We will bring new knowledge and awareness on circular economy, sustainable practice in waste management, production and consumption and hopefully deliver results and knowhow that can be of positive impact, inspiration and in establishing more PIPO systems in Copenhagen, Europe and the world.

# How?

A**ctivities:** Our solution involves the implementation of prototypes on technologies, services, work processes and new products in a recycling-production-consumption system, as well as promoting and training for positive transformation of habits and practices on the basis of our results and business cases, in the forms of workshops, guides, exhibitions, open meetings, etc.

We will test prototypes on: 1) services for sourcing and buying plastic waste from local generators as well as 2) services targeted at local product designers and manufacturers for ordering recycled building materials on demand from processors. We will test 3) logistics and work processes for collecting, handling and processing plastic waste to new materials, involving tasks such as sorting, washing, shredding and moulding, as well as potentially 4) testing processes for collecting products when their lifecycle ends. Last but not least, we will 5) offer training to producers/manufacturers, resellers and end-buyers on how to design, manufacture and consume more sustainable, 6) the production of new products made from locally sourced plastic building materials, and experiments on reclaim solutions.

PIPO will be implemented in two stages:

*Phase 1: Implementation of the Generator-Processor-Producer system model.* We will roll out a small-scale prototype of a resource recycling system focused on the technological, logistical and system implementation of the Generator-Processor-Producer system by establishing a small scale plastic processing and recycling facility at Underbroen. We will offer training in plastic management to ensure long-term impact, and engage in prototyping products from recycled plastic building materials.

*Phase 2: Implementation of the full system model.* In the second phase we will scale up the capacity of the system implemented in the previous phase (i.e. engage more actors) and implement the remaining two functions of the system model, Resellers and End-buyers/Micro processors. It is also our ambition to support the conceptualization and tentative establishment of CIDE Lab.

**Main stakeholders and responsibilities:** Our main stakeholders in the Generator-Processor-Producer chain are *BetaLab* (physical establishment of the processing facility), *Von Plast* (operating the processing facility), *ChipChop, SILK Design Studio, as well as other members at Underbroen* (designing and producing products). While establishing contact and agreements on sourcing plastic waste from local Generators, *Aage Vestergaard Larsen*, will provide us with plastic granulate, to get the system going from day 1. In Phase 2, main stakeholders are also resellers and end buyers, in developing and implementing the reclaim solution(s). Maker will be in charge of training of all stakeholder groups.

**Budget:** Establishment of the physical Processing facility will be costly. Our partner in Underbroen, BetaLab, will invest in the equipment and establishment of the facility as a permanent offer at

Underbroen (following our partnership framework agreement). Memberships (i.e. 24/7 access to the facilities) for stakeholders not already members at Underbroen (Von Plast, CIDE Lab, designers) will be purchased from BetaLab for the whole Phase to an estimated total cost of €8-12.000 (following our partnership framework agreement). We will have costs for transport, plastic granulate (in the first months), as well as printed materials for training, accommodation at stakeholder meetings and workshops, as well as exhibitions, etc.

**Data collection:** Data collected in Phase 4 will be used to analyse efficiency, quality and value of the system. We will collect data on the five functions (Generator, Processor, Producer, Reseller, End-Buyer/Micro Generator) and also on the logistical and service systems that connect the functions to each other. The overall goal is to be able to analyse the system as through the implementation phase, as well as documentation of results by the end of the prototyping phase to present a business model and cases.

*Quantitative data:* we will collect data on number of stakeholders engaged in each function as well as their respective inputs/outputs in the system (i.e. plastic sourced, recycled, processed, as well as product prototypes produced, sold, and reclaimed). We will also be monitoring turnover in the overall system as well as in the respective functions and services (i.e. monitoring costs, revenue, productive hours, etc.). We will also be monitoring the surrounding inputs/outputs to conduct a second life cycle analysis on the system based on the data collected (meaning registering kilometres driven, electricity and water usage, etc.). Finally, we will start building a database of plastic types (i.e. data sheets).

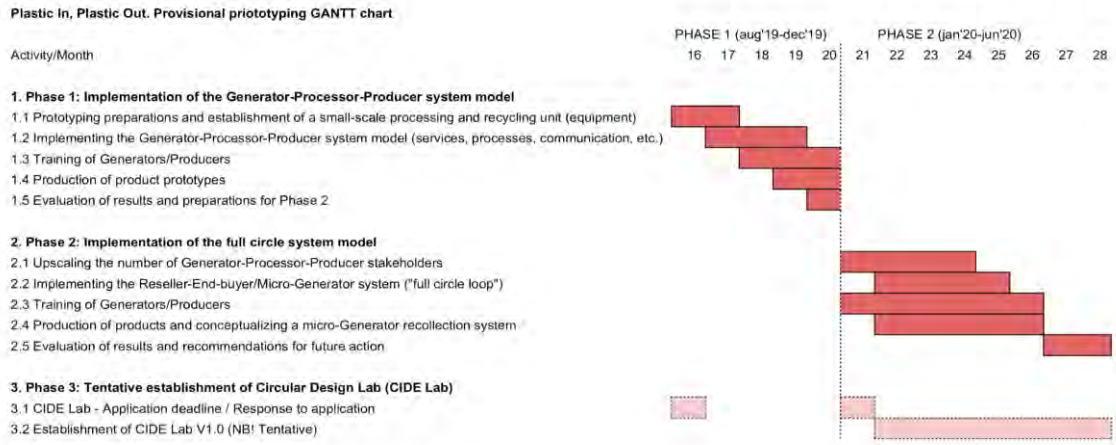
*Qualitative data*: we will do interviews and qualitative assessments of the system with all engaged stakeholder groups to get feedback on the experienced efficiency and usability of the system, i.e. logistical systems, quoting, buying/selling, prizing, value, quality, functionality, availability of material (waste, building materials, goods).

# When?

**Duration:**

- Phase 1: August 2019 - December 2019
- Phase 2: January 2020 - June 2020 (tentatively being part of constituting and establishing "CIDE Lab 1.0": August 2019-October 2020 (an onwards)

**Times scope:** *Provisional GANTT chart below*



# Comments

Our prototype is a system model that will be tested in a real life setting and the local context of Copenhagen. The point is to create documentation and guidelines of the system model itself, its stakeholders, results and potential impacts, to be shared freely locally and in general. Thus, it is our hope that the results of the PIPO project can benefit the processes of establishing and constituting CIDE Lab, but also the City of Copenhagen's existing initiatives at the new Recycling Centre Sydhavnen, as well as spark new initiatives - potentially small-scale versions in other Fablabs, makerspaces, etc.

At the time of writing this report, the initial steps for establishing CIDE Lab have already been taken, with Maker as a co-creator. We are involved in the initial fundraising applications, community building activities and consulting CIDE Lab. CIDE Lab are currently preparing a larger funding application to the Danish Innovation Foundation and will receive reply in late 2019 with a tentative kick-off of rolling our CIDE Lab V1.0 in the beginning of 2020. We will follow the development of the project first-hand and - having them as one of our core stakeholders in the prototyping phase - make sure that results will be exploited in CIDE Labs birth. It is unsure whether we will be able to test the micro generator → processor link in the system, as we don't know if any of the products produced in the system will "end their life" in the scope of Phase 4. However, we will actively engage any end-buyers of products produced in the system and continue the co-creation of solution to close the loop throughout the experimentation.

Please see Annex II p. 23-24 for the complete description of the idea canvas and the Experimentation Canvases

## 3.3. Policy Making in the implementation of the co-creation journey

- Getting to know the local political context better.

We have learned that it is difficult to engage policy makers on higher decision levels as well as elected decision makers due to busy schedules. We have concluded that to engage them actively in activities, we need to book meetings far in advance (i.e. 6 months or more). Circular economy is one of the most prioritized agendas in Copenhagen at the moment. It is a goal in the City of Copenhagen to be the frontrunner in circular economy and circular initiatives and to secure a CO2-neutral Copenhagen in 2025. Therefore, there is an interest in in our challenge and solution. The City of Copenhagen have implemented many initiatives on circular economy in the past (and more in the coming years). However, we find that their initiatives are - even if they are involving external partners and stakeholders actively in the activities - quite closed to new external stakeholders - our project being one. This of course has to do with planning, resources and management - again early and continual informing as well as meetings with municipal project managers are of key importance.

The city has for an example established and opened the new recycling facility, Sydhavns Genbrugscenter, with a core focus on circular economy. The facility is new (opened in May), and we have established contact to them. There are many overlapping goals (experimenting with alternative circular production models), but it has been difficult to get them to engage is PIPO as well as to get access to their projects here. This could lead to the conclusion that co-creation projects like our, initiated without the initial active engagement of policy and decision makers in Copenhagen, will have difficulties i.e. being adopted and supported at policy level, if they don't have a political mandate from the beginning. This is interesting, and we might be exploring this thesis, as part of the constitution and establishment of CIDE Lab.

- Engagement with policy makers

We are engaged policy makers by informing both policy makers and elected city representatives through emails, invitations and participation in workshops and Maker Meet Ups, as well as through one-on-one meeting with the Technical and Environmental Administration in Copenhagen. We had a meeting with the Mayor of Culture and Leisure in Copenhagen, and informed her about our local co-creation challenge, activities and possible solutions. We already had good connections in the Departments of Technology and Environment and Culture and Leisure - stakeholders with interests in innovation in circular economy as well as creative growth in micro entrepreneurs and SMEs.

The Department of Technology and Environment is furthermore the Coordinator of another H2020 project, CIRCuIT, about circular economy in the built environment where we are partners. We have presented our SISCODE co-creation challenge + solution and initiated a dialogue about sharing knowledge and findings between SISCODE and CIRCuIT. The positive feedback we have gotten so far underlines the relevance and necessity of our solution . Currently, we are in a dialogue with Naboskab - a consultant to the City of Copenhagen responsible for managing their experimentation at Sydhavns Genbrugscenter. This municipal initiative is a good opportunity to exploit findings, knowledge and initiatives from our local SISCODE challenge on a policy and potential city level - e.g. locally sourced plastics from the Cities own waste management system.

*Table 22 Underbroen - About the policy gaps and suggestions:*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| No existing systems for sourcing waste materials from municipal recycling facilities. | Experimentation on how to open up for sourcing local waste materials for local Processor, for example using the Sydhavns Genbrugscenter as a starting point for experimentation. |
| Co-creation is often used as a tool for citizen empowerment, but often only in initial stages. | Ensure to establish cross-sector collaborations that creates ownership for all involved stakeholders - long term project. |
| Gaps between future waste management plans and the present and actual opportunities, initiatives and models. | It is important for the City of Copenhagen to embed and utilize already existing initiatives, knowledge and models in the Resource and Waste Management Plan 2024. |
| Gaps in current waste management solutions and the support of future EU waste rules by 2025 | Collaborating with local “Producers” and “End-buyers” on co-creation sustainable solutions for the coming implementation of Extended Producer Responsibility actions. Potentially establishing a citizen advisory board. |

- Future actions and suggestions for WP4 workshops

Stakeholder workshops and training in collaboration with Sydhavns Genbrugscenter for Generators, Producers and End-Buyers. Lab for Policy Makers by the end of Phase 4 where relevant policy and decision makers will be presented to the PIPO findings and potentials. framed using the identified and potential future policy gaps.

## 3.4. **Monitoring of the process**

- Synthesis of the activities

*Table 23 Underbroen Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | 1.1 Context Analysis<br>1.2 Mapping of best practices<br>1.3 Mapping of existing ecosystems and models, especially circular economy<br>1.4 Diagnosing policies & legislation<br>1.5 Establish stakeholder relationships & engagement | literature reviews<br>case studies<br>product analysis<br>contextual inquiry<br>informal interviews<br>meetings<br>workshops<br>field trips<br>geographical mapping | Theoretical and methodological knowledge about circular economy<br>Quantitative and qualitative data about waste management and recycling<br>Precious Plastic Machines are good for prototyping but not for scaling high quality material production (plastic sheets)<br>Most plastic waste is being burned or put in landfills<br>The city has come up with a new Resource and Waste Management plan (2024), targeting similar challenges and solutions as we do<br>Smile Plastic products are not as clean and sorted as it says on the data sheets<br>Local designers and makers are eager to work with recycled plastic as long as the quality is of high standards | 23 | |
| Phase 2 | 2.1 Transferring knowledge (Feedback Sessions)<br>2.2 Informing (Newsletters and Maker Meet ups)<br>2.3 Recruiting and engaging stakeholders<br>2.4 Stakeholder visits and meetings<br>2.5 Establishing an advisory board (AB) for the project | workshops<br>contextual inquiries<br>simplified life cycle analysis<br>Actor-Network tools<br>stakeholder mapping<br>idea cards<br>business model canvas<br>maker meet up<br>mail invitations<br>informal interviews<br>stakeholder visits | | 28 | 2.5: We have not established an advisory board yet on a formal scale, but we have established relationships to relevant stakeholders in a future advisory board. |
| Phase 3 | 3.1 Ideation<br>3.2 Refine Concepts<br>3.3 Selection of ideas<br>3.4 Planning and Finding compromises | design brief and challenges<br>stakeholder visit (case study)<br>evaluations<br>presentations<br>internal meetings<br>Business model | | 61 | |

*Table 24 Underbroen Stakeholder engagement*

| Effective Stakeholder group | | Level of engagement | | | | Comments on the effective participation and relevance (any changes from D3.1, why?) |
|---|---|---|---|---|---|---|
| | | Co-Producing | Co-Designing | Consulted | Informed | |
| Local designer and maker community, and citizens | Von Plast | ☒ | ☒ | | | The collaboration with Von Plast has been established formally, and the collaboration is going well. A key Processor stakeholder in the implementation if PIPO. |
| | Underbroen designers and makers | ☒ | ☒ | ☒ | | The group of makers and designers are still active, and we will engage them as Producers in the prototype phase from August 2019.<br><br>Still counting: ChipChop, Slik Design Studio, and Nils-Ole Zip. Possibly more engaged throughout the Phase 4. |
| | BetaLab | ☒ | ☒ | ☒ | ☒ | The collaboration with BetaLab has been established formally, and the collaboration is going well. Still very relevant as part of the core stakeholder group as providers of Processing facilities. |
| | CIDE Lab | ☒ | ☒ | ☒ | | Andreas Zacho from Von Plast (here as a citizen) is the initiator of the CIDE Lab, and findings, knowledge etc. from the SISCODE project will be used in the future fundraising and establishment of CIDE Lab. This is a good change and development since it enables a great afterlife of the SISCODE project and opportunity to scale ideas and solutions in the future. |
| Research and academia | Vallekilde Højskole | ☒ | | ☒ | ☒ | Training, Design brief and sprint about designing with recycled materials. |
| | AAU | ☒ | ☒ | | | The student group's project is now handed in and finish, and we will evaluate the findings during the summer. We will keep them informed and hopefully establish a now stakeholder relation with a new group after the holidays (new semester), for one to do a final product life cycle analysis |
| | KEA | ☒ | ☒ | ☐ | ☒ | We have not succeeded to reach the right person at KEA in order to add the formally to the stakeholder group, but will continue in order to activate their students in the prototype phase. |
| Industry and NGOs | Aage Vestergaard Larsen | ☐ | ☐ | ☒ | ☒ | We have used them for consulting, inspiration and for networking, and will keep them in the loop. Hopefully AVL will also be the provider of shredded recycled plastic for our prototype. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Plastic Change | ☐ | ☐ | ☒ | ☒ | We will keep them informed and continuously collaborating when needed. |
| | Bloxhub | ☐ | ☐ | ☐ | ☒ | Their role has changed a bit, and will only be informed and potentially used as platform for reaching an industrial community as well as decision makers. |
| The City of Copenhagen municipality | Sydhavn Genbrugscenter | ☒ | ☒ | ☒ | ☒ | Sydhavn Genbrugscenter one of the central circular initiatives within the City of Copenhagen. Access to good recycling and reuse facilities, and waste materials. |
| | Technical and Environmental Administration | ☐ | ☐ | ☒ | ☒ | The key department in the City of Copenhagen that works on policies and initiatives supporting the context of the local SISCODE challenge. |
| | Naboskab | ☐ | | ☒ | ☒ | Naboskab helps the public sector, organizations and businesses to become more circular and sustainable. They are specialized in the intersection between anthropology and waste. They work with the combination of insights into human behaviour and hands-on knowledge of initiatives and solutions within circular economy, waste and resource areas. |
| Changes in the stakeholder group | MatKon | ☐ | ☐ | ☐ | ☒ | We have chosen not to continue the collaboration with MatKon, who was one of the initial main stakeholders. The reason for this is rooted in different objectives and understandings of the collaboration. |
| | Specialisterne | ☐ | ☐ | ☐ | ☐ | Due to the decision not to work with MatKon Specialisterne is also not part of the stakeholder group anymore, since MatKon and Specialisterne are partners. They might be a relevant co-producer in the establishment and business model of CIDE Lab. |

# KTP

## Exploring

Air pollution, policy, air protection programme, local context, Inhabitants needs, inhabitants involvement

## 4. KTP's journey

The KTP challenge is related to know-how, lessons learnt and best practices achieved during creation of SMART KOM strategy, a specific roadmap for smart solutions in Kraków and the Kraków Metropolitan Area that was developed by KTP together with urban and regional authorities and foreign project partners between 2013-2015. One of the key challenges arising from the strategy is to improve quality of life by integrating and promoting activities aimed at improving the health and physical condition of the Krakow population mainly focused on air pollution and mobility. It all will lead to creation of common space for citizens, policy makers and other stakeholders for self-development, realization and doing the business. The defined challenge is in line with the local and regional strategies referring to the Air Protection Program for the Małopolska Region and Integrated Quality of Air Management System in Krakow, both aiming to achieve permissible levels of air pollutants in the whole Małopolska Region by 2023 with lower levels of: PM10, PM2.5, benzo (a) pyrene, nitrogen dioxide and sulfur dioxide.

KTP's challenge is to improve the quality of the air in Krakow by motivating citizens to change their ecological attitudes, transport and heating habits and support decision makers with relevant tools and instruments for better co-creation of local new policies with user centered approach. It is worth to mention that during last few years thanks to the involvement of regional and local decision makers, politicians and bottom up activities the awareness on air quality and its impact on health and environment has improved significantly, but it still requires a lot of commitment and individuals involvement. To manage the challenge the network of Eco-advisers in Małopolska municipalities has been established. They will support the implementation of the Air Protection Program, acquire external funds for actions that reduce emissions and mobilize residents to participate in these actions. From the other hand they will advise the inhabitants of the Małopolska Region on the most effective ways of reducing emissions and sources of financing, including preventing energy poverty through energy saving measures.

## 4.1.KTP's journey implementation

### 4.1.1. Phase 1: Analyzing the context

- Process and methodology

In order to specify the challenge and identify the basic needs this phase contained the following activities:

- Analysis of documents and definition of the current status and context of the challenge – national and regional reports, legal acts, academic analysis etc.
- Discussing the challenge during numerous meetings with: Marshal office of the Malopolska Region, Department of Environment; City of Kraków, Plenipotentiary for Air Quality Management; Department of Air Quality; The Metropolitan Association of Kraków; Public Transport Entity, The Smogathon Initiative, Cracow Smog Alert
- The opening meeting starting the consultation process on new Air Protection Programme for Małopolska Region, co-organized with the Marshal Office in KTP was held on 11th of February 2019. Conference was attended by approximately 220 participants representing different stakeholders. Agenda was filled in with experts' presentation on the different aspects of air pollution, best practices from particular districts of the region, key activities and challenges. Moreover the moderated discussion and Q&A session were held in order to listen to the opinions of all participants

- Main outputs and results

The main result of this phase has been the final version of the challenge, adjusted to the current needs and problems in the region of Malopolska. The detailed outputs are the following:

Overview of the local challenge, prepared map of the existing stakeholders, identification of the key facts;

- Notes and insights useful to update the Challenge: local context. Presentations given by the experts and speakers gave a broad spectrum of the main reasons of the air pollution problem in the region. Many interesting plots have been opened and discussed. It gave to the project team a significant overview necessary to particularise the challenge;
- Final definition of the challenge and activity plan (recommendations for the new Air Protection Programme for Malopolska Region);
- Summary and monitoring of the undertaken activities and their results in the frame of air pollution; definition of the main constraints in the air protection programme implementation in the region. See some pictures on annex II p. 26.

*Table 25 Synthesis KTP*

| | |
|---|---|
| Theme | Air pollution, policy, air protection programme, local context, inhabitants needs, inhabitants involvement |
| Needs | It is crucial for sustainable development of city ecosystem to increase the level of municipal or metropolitan citizen activity. To rely and count on the creativity and subjectivity of its citizens in designing public services to a greater extent Krakow has to reorganise the structure and dynamics of urban ecosystems in order to harmonize and create better conditions for self-development, to deliver the high quality services and prevent from social exclusion. The direct and underlying causes of the challenge are: mobility and environment. The challenges are: proper organisation of multimode transport, efficient struggle against environment pollution, balanced and polycentric development of the city. In the area of Smart mobility, as Kraków has become a place of work, studies and various types of services used by hundreds of thousands citizens of the agglomeration, and therefore it is particularly important to connect the agglomeration transport (the Fast Suburban Rail, buses) with the municipal transport. It is necessary to create the possibility of changing many means of transport to collective transport, or within the collective transport. There is a need for integration and coordination of different transport systems. |
| Main policy context elements | Public authorities adopted the Development Strategy of the Malopolska Voivodship for the years 2011-2020. A part of it is dedicated to the environment protection. The program presents activities planned for implementation in 2014-2020, including those that do not result from the direct competence of the Małopolska Region Self-government. It is therefore a document comprehensively treating the tasks of environmental protection through specific priorities and the most important directions of activities. The strategy is the basic and the most important document of the voivodship self-government, defining the areas, objectives and directions of development policy interventions, conducted in the regional space. Bearing in mind the obligations under the Local Government Act, the basic responsibility of the voivodship self-government in creating and implementing voivodship development strategy focuses on shaping broadly understood civic and cultural awareness, modern economic development as well as sustainable environmental and spatial management. |

### 4.1.2. Phase 2: Reframing the problem

- Process and methodology

In the second phase of our co-creation journey we decided to conduct workshops aimed at diagnosis of the problem and identifying the main difficulties and challenges in the effective air protection. We have identified two crucial tasks, which had to be done in parallel. It was very important on the one hand to design and plan the methodology of the workshops and on the other hand to conduct wide information campaign in order to gather at the workshops representatives of all relevant stakeholders, especially inhabitants who are not directly involved in the structured actions in the topic of air protection, but are the final users of the existing policies.

We have sent numerous invitations to representatives of administration, academic centres, NGO's and business, but big attention was given to dissemination of the information in the social media, in order to reach inhabitants.

Methodology of the workshops was based on the design thinking methods. After the analysis of conclusions from the consulting meetings; many direct and online discussions with representatives of Marshal Office (regional authority structure, responsible for the preparation and management of the Air Protection Programme for Malopolska), we have decided to work on the personas. We have created 5 personas, representing different possible inhabitants of the region, with different economic status, education, family situation, age, lifestyle. The participants of the workshops were asked to prepare empathy maps for these personas, to get beyond their perspective and think what kind of everyday problems of different people affect the issue or air quality and how these personas would like the situation to be improved.

The workshops "Let's talk about air. Sharing ideas" were held on 4$^{th}$ of March in KTP's premises, 45 participants were divided into 5 groups and worked on the empathy map, idea selection canvas.

- Main outputs and results

As a result of the first workshop we received a bunch of ideas and conclusions generated by the participants and initially prioritised. We have obtained the diagnosis of the situation in the region in terms of air quality, which included the needs of different stakeholders, their expectations and possibilities to introduce changes. What we wanted to achieve in this phase was the real deep analysis, on the reasons behind the indicators; to learn not only what the quality of air in the region is, but also why it is not improving, even though the administration is introducing new regulations and instructions. We have received a set of conclusions and real reasons, which created a base for the further work and next phase. We have defined needs of all stakeholders, their initial ideas for the solutions and prioritised them.

We have noticed we didn't get enough involvement of the inhabitants. Despite the fact that the information was widely disseminated, most of the present participants were representing interest groups such as administration, science or business. In order to better diagnose the problem and prepare for the next steps we decided to organise two additional meetings with local communities, which are described in the next part.

*Table 26 KTP key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| S1 Marshal office of the Malopolska | Author and manager of Air Protection Program for Malopolska Region | As the manager of preparation of the APP they are directly involved in the process and are interested in the results of co-creation process |
| S2 Inhabitants of the region | Final users of the air | As the final users it is crucial to include their needs and expectations in the process |
| S3 Local authorities | Developers of the APP | As the implementing bodies they need to understand the process and be a part of creation of the regulations |
| S4 Regional academic and scientific centres; public institutions | Providers of the knowledge and expertise | Ensure that APP programme is based on current updated air protection guidelines and regulations |
| S5 Business | Providers of possible products and solutions | To understand the expectations and support local authorities by concrete products and solutions |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 27 KTP Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | To improve the quality of life by integrating and promoting activities aimed at improving the health and physical condition of the Krakow population mainly focused on air pollution and mobility. |
| Synthetic formulation of the reframed challenge. | The KPT's challenge is to improve the quality of the air in Krakow by motivating citizens to change their ecological attitudes, transportation and heating habits and to support decision makers with relevant tools and instruments for the co-creation of local new policies applying a user centered approach. |

### 4.1.3. Phase 3: Envision alternatives

- Process and methodology

As already mentioned above one of the conclusions coming from the second phase of co-creation journey was that we did not receive sufficient involvement in the first workshops of the inhabitants coming from the region. So despite the fact that the workshops groups were working on the personas, who represented different types of inhabitants, we cannot be sure that we included their perspective in the diagnosis and reframing the problem. So in order to provide that we organised two additional meetings. We selected two gminas (regional communes) and decided to organise the meetings there, adjusting also the hours so that people who are working could join. Meetings were held in Zabierzów on 20.03.2019 and in Lusina on 26.03.2019.

We opened the discussion, asking participants of these meetings what problems and needs regarding the quality of air they notice and face, what are their expectations and ideas on how the problem should be solved. After these two very intensive and fruitful meetings we had complete and deep diagnosis of the situation and we could proceed to second open workshops. Based on the materials coming from the phase 2 and two above-mentioned meetings the methodology of the second workshops has been elaborated.

We have collected all the initial ideas from the first workshops and from meetings with local communities and identified three main categories: Transport and mobility, Effective information and consultation, Monitoring and controlling system. The categorised ideas were supposed to be the starting point for the work of the groups during second workshops.

The workshops "Let's talk about air. Generating solutions" were held in KTP's premises on 1st of April 2019. This time again the registration process was opened to all interested stakeholders, however we mentioned that three main areas will be covered by the workshops: transport, communication, monitoring. We have gathered 46 participants who selected to which of three groups they would like to belong. The material for the participants (sets of categorised ideas from previous events) were delivered before the workshop. The base for the work was the modified project canvas. Each group selected min. 1 idea which they found most suitable and feasible and elaborated project canvas.

- Main outputs and results

Thanks to additional meetings with local communities we obtained deeper understanding of the inhabitants' perspectives. They provided us with diagnosis of their needs but also initial ideas which could be further developed.

During second workshops 8 project ideas have been selected and elaborated. Three groups prepared 8 project canvas for ideas which should be further developed in the process of preparation of new Air Protection Programme.

As a result of the first workshop (Let's talk about air. Sharing ideas) and meetings with local inhabitants 49 ideas have been identified (13 ideas in the field of transport and mobility, 23 ideas in information and communication, 13 ideas in monitoring and control). Out these 49 ideas the participants of second workshops (Let's talk about air. Generating solutions) selected 8 ideas for further development and analysis. All the above-mentioned 8 ideas will be taken into consideration while preparation of the new Air Protection Programme for the region. The experts will further develop and elaborate them and introduce them in the document. We will not select one of the ideas for the prototyping phase, as our product of prototyping is the APP itself and it will include all the products of the ideation workshops. However we noticed the need to further develop some of the ideas, for example ontransport and mobility topic. Moreover in the prototyping phase we plan to organize Smogathon (hackathon on air pollution topic), where we will select one project to be implemented. It will be in one of the three thematic ideas which are the result of the workshops (Transport and mobility, Effective communication and information, Monitoring and controlling).

The following table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project

*Table 28 KTP ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Mobility and public transport: Clean transport area | Inhabitants of the region, administration | New policy | Feasibility, multifunctional (covering various areas of intervention), short-term implementation | Change of habits and attitudes of citizens |
| Mobility and public transport: Agglomeration transport | Inhabitants of the region, administration | New policy | Feasibility, multifunctional (covering various areas of intervention), already existing infrastructure capacity | Multi-stakeholder cooperation |
| Effective communication and information: Creating a model approach of communes to the problem of smog on the example of the Skała commune | Inhabitants of the region, administration | New policy | Originality, feasibility, scalability | Financial capacity |
| Effective communication and information: Involvement of the Church in the fight against smog | Inhabitants of the region, administration | New policy | Originality, shared value, easy to be implemented without financial resources | Multi-stakeholders cooperation |
| Effective communication and information: Information campaign: "I don't believe in smog" | Inhabitants of the region, administration | New policy | Originality, feasibility | Financial capacity |
| Effective communication and information: Educational activities in schools | Inhabitants of the region, administration | New policy | Feasibility, sustainability | |
| Monitoring and controlling: Standardization of the controlling system in the Malopolska region | Inhabitants of the region, administration | New policy | Importance of the solution; impact | Different interests of stakeholders |
| Monitoring and controlling: Educational aspect of the controlling system | Inhabitants of the region, administration | New policy | Feasibility, sustainability | Financial resources |

## 4.2. Solution: the selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| *Preparation of the new Air Protection Programme for Malopolska* |

# What?

**Description :** Our solution will adopt the Air protection plan (policy) that is being created with deep and wide involvement of the residents of Malopolska region thanks to opening the consultation process and involving representatives from 4 sectors (administration, science, NGO and representatives of communities and business) in co-creative workshops where they defined and described the 8 abovementioned ideas that will support the implementation the air protection plan in short and long term.

# Why?

It is crucial for the sustainable development of city ecosystem to increase the level of municipal or metropolitan citizen activity. To rely and count on the creativity and subjectivity of its citizens in designing public services to a greater extent Krakow has to reorganise the structure and dynamics of urban ecosystems in order to harmonize and create better conditions for self-development, to deliver the high quality services and prevent from social exclusion. The direct and underlying causes of the challenge are: mobility and environment.

# How?

**Activities:** Prototype the main assumptions of the APP among regional decision makers in the following cities: Tarnów, Nowy Sącz, Chrzanów, Nowy Targ, Kraków. The template of the APP including the 8 project ideas will be presented and consulted with regional stakeholders during public consultation meetings. They will be able to give their comments and analyse if they will be able to adapt the proposed solutions in their communities.

To allow local decision makers to increase their input in the APP from their local perspective

**Main stakeholders and responsibilities:**

Marshal Office (UMWM), Regional and local authorities, Inhabitants (local communities)

# When?

**Duration. Times scope**

- Prototyping activity (July – September 2019) will be focused on shaping the terms of references to be published by regional authority to choose the entity which we elaborate the final version of APP (public procurement)
- Meetings/ consultation with regional authority to deliver the main assumptions of the APP & the guidelines for terms of references including among others identified ideas and recommendations of participants of the workshops – responsible: KTP & UMWM
- A notice of invitation to tender – responsible: UMWM (Regional authority), KTP informed
- Meetings/ consultation with selected entity for APP policy assumptions (draft version) – responsible: UMWM, KTP involved

- Demonstrating and testing (September – December 2019) will focus on testing the APP policy (draft version) in the Malopolska communities among regional decision maker & inhabitants
- 5 local consultation meetings in 5 cities of Malopolska Region: Tarnów, Nowy Sącz, Chrzanów, Nowy Targ, Kraków) to assure local inhabitants and local decision makers involvement in policy creation to increase their input in the APP from their local perspective - responsible: UMWM, KTP involved
- Meetings/ consultation with regional authority and entity responsible for elaboration of APP policy - responsible: KTP & UMWM
- Official consultation of the final version of APP policy (last but not least consultation via traditional channels) – responsible: UMWM (Regional authority), KTP informed
- Readiness for APP implementation (January 2019) presentation of the Program for the approval of the Regional Board of Malopolska Region (official procedure for approval of new legislation acts) responsible: UMWM (Regional authority), KTP informed
- Monitoring and assessing – how the APP is adapted in the regions + testing the solution from Smogathon in selected commune (till June 2020) – responsible: UMWM & KTP
- Local authorities engagement and level of satisfaction – indicator: number of people/ communities who attended the meetings in 5 counties/ gminas, scale of involvement & satisfaction
- Policy makers awareness and involvement – indicator: number of decision makers and officials who attended the meetings in 5 counties/ gminas
- Testbeds of solution created during Smogathon – based on the list of ideas created during workshops – indicator: number of potential solutions generated during hackathon, number of participants of the hackathon, number of implemented solutions responsible: KTP, UMWM involvFinal version of the APP ready to be implemented to become a binding document for all Malopolska – responsible: UMWM

Please see Annex II p. 27-28 for the complete description of the idea canvas and the Experimentation Canvases.

## 4.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

Environment protection is the responsibility of public authorities, which directly results from art. 74 par. 2 of the Constitution of the Republic of Poland. The scale of impact and the scope of air pollution, as well as the ineffectiveness of activities aimed at limiting the concentrations of selected pollutants, have caused that issues related to air quality have become a huge challenge for government and administration both at the central and local level.

Public authorities adopted the Development Strategy of the Malopolska Voivodship for the years 2011-2020. A part of it is dedicated to the environment protection. The program presents activities planned for implementation in 2014-2020, including those that do not result from the direct competence of the Małopolska Region Self-government. It is therefore a document comprehensively treating the tasks of environmental protection through specific priorities and the most important directions of activities. The strategy is the basic and the most important document of the voivodship self-government, defining the areas, objectives and directions of development policy interventions, conducted in the regional space. Bearing in mind the obligations under the Local Government Act, the basic responsibility of the voivodship self-government in creating and implementing voivodship development strategy focuses on shaping broadly understood civic and cultural awareness, modern economic development as well as sustainable environmental and spatial management. This document needs to be permanently updated and adopted to dynamic circumstances. It is necessary to involved

all actors and stakeholders in the processes of validation and revision of the Strategy in order to cover all dimensions.

.The process of creating legislation with the direct and active involvement of residents is extremely important for the administration. It gives the administration the opportunity to learn the perspective of residents as direct stakeholders and recipients of legislative processes, and at the same time ensures that the proposed solutions and improvements will take into account the real expectations and needs of residents, giving them a sense of influence and agency. In addition, involving residents in the process from the very beginning makes understanding and acceptance of the proposed changes. Such an approach does not question the sensibility of activities carried out so far at the legislative or financial level, but shows that there is a lot to be done at the level of communication, education, accessibility and consistency of existing and proposed actions.

Co-creation workshops carried out by KTP are the best confirmation of this, as demonstrated by the commitment and opinions of the participants themselves. They confirmed that despite the difference of opinions, the workshops created a space for discussion, in which each participant had the opportunity to present their opinion, present their idea. Despite a diverse group, with a different approach to the subject of air quality, different interests and expectations, thanks to the use of creative working methods, many interesting ideas for actions and solutions that are worth further development and development have been signaled. The great involvement of the participants, who also devoted their private time, testifies to the fact that they appreciated the openness and transparency of the process. Thanks to the creative discussion during the workshops, the groups have created many interesting ideas that take into account the diverse view of the air problem. The use of creative methods involving all interest groups in an open discussion is extremely valuable and important for the processes of social consultations. Co-creation workshops carried out in Lesser Poland by the Krakow Technology Park team were an innovative venture on a national scale. The Department of Environment of the Marshal's Office of the Małopolska Region played a key role here. It decided to fully open the consultation process by inviting the residents to the discussion. The results show that it is worth continuing and developing this model of work on a large scale.

- About the policy gaps and suggestions

*Table 29 KTP: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Regional legislation depends on national legislation. The national one is not always ready on time and is influencing the timeline of regional legislation. | National regulations should be ready prior to regional. |
| Local authorities cannot fully implement the new regulations due to insufficient financing | Planning budget to support necessary changes. |
| Not sufficient involvement of the citizens in creating the policies | Open and wide consultations with more direct involvement |
| Unclear identification of the responsible units and division of competences between different institution at different levels (national, regional, local) | One strategy of action in terms of air quality improvement with unequivocal division of tasks and competences in administration |
| Divergent needs and interests between regional and local authorities and communities (for example in transport area) | Clearly identified priorities, objectives, indicators which should be achieved |

- Engagement with policy makers

The co-creation journey has been so far conducted in strong cooperation with authorities, especially Marshall Office for Malopolska, who is directly responsible for preparation of new Air Protection Programme.

We have conducted numerous internal meetings, where whe discussed every part of co-creation journey in order to meet expectations of all sides.

It was the first time that Marshall Office decided to open the consultation processes beyond formal way and gave KTP possibility to conduct the journey. Their final opinion is very positive and they are very satisified with the recommendations which were delivered after 3rd phase of the journey.

- Future actions and suggestions for WP4 workshops

Beside effective regulations, there is a need to provide clear and easy support instruments (ex. financial support), as very often the inhabitants are willing to introduce changes, but the bureaucracy and administrative barriers are discouraging.

## 4.4. Monitoring of the process

*Table 30 KTP Stakeholder engagement*

| Effective Stakeholder group | Level of engagement | | | |
|---|---|---|---|---|
| | Co-Producing | Co-Designing | Consulted | Informed |
| Marshall Office of Malopolska Region, Environment Development | ☒ | ☒ | ☒ | ☒ |
| City of Krakow, Plenipotentiary for Air Quality Management | ☐ | ☐ | ☐ | ☒ |
| The Metropolitan Association of Krakow (representing 15 communities around Krakow) | ☐ | ☐ | ☒ | ☒ |
| University of Science and Technology | ☐ | ☒ | ☒ | ☒ |
| Cracow University of Technology | ☐ | ☒ | ☒ | ☒ |
| Krakow Smog Alarm activists group | ☐ | ☒ | ☒ | ☒ |
| ICT companies, SMEs, start ups | ☐ | ☒ | ☒ | ☒ |
| Media/wider public | ☐ | ☒ | ☒ | ☒ |

# PA4ALL

Exploring

ICT in agriculture, innovative learning methods, Big Data,

Precision agriculture, farmers

## 5. PA4ALL's journey

The main goal of PA4ALL is introducing precision agriculture tools in high schools specialized in agriculture by presenting the benefits of using the ICT in agriculture and encouraging high school students to uptake new trends and innovations. PA4ALL started by engaging stakeholders such as farmers, start-up networks, SMEs and education system actors (teachers, students) and policy makers in obtaining more information about the pivotal changes which needed to be made in the educational system. Since the aim was to improve the curriculum in schools specialized in agriculture and change the adoption of ICT in schools on a larger scale, their input was crucial. This also relates to the notion that the younger agricultural household members are a demographic group that has demonstrated higher adoption rates of technology. Therefore, our initiative will bring long term benefits to agriculture production and the labour market in Serbia, since a new generation of professionals will be created. Additionally, by addressing these changes, the Serbian economy as a whole will be influenced, since with the adoption of ICT, processes in different industries will be facilitated

## 5.1. PA4ALL's journey implementation

### 5.1.1. Phase 1: Analysing the context

- Process and methodology

One of the major milestones for idea development was the workshop in Milan, when new concepts were introduced, and different strategies discussed on how to introduce co-creation in the ecosystems of the connected Living Labs. The consortium of the SISCODE project provided valuable information on how to start desk research and context analysis and start the Phase 1. Since PA4ALL focuses on applying co-creation methodology for developing new educational opportunities, on involving students in science and research, interviews with students and teachers were conducted. Furthermore, in order to connect education to the current market needs, consultations with the innovative ecosystem around BioSense (farmers, SMEs, agtech and foodtech entrepreneurs), as well as with policymakers were undertaken. Analysing the context was done in three steps: a) Desk Research b) Interviews with relevant stakeholders and c) Synthesize and analyse data.

Firstly, the Desk Research was undertaken in order to identify the crucial aspects lacking in the educational systems of Serbia related to ICT and agriculture. Material used for this research were documents on Digital Strategy of Serbia and Strategy of development of information society in Serbia 2020. Furthermore, desk research uncovered existing initiatives promoting IT education in schools and helped us develop next steps for conducting interviews.

Secondly, one school was selected as a reference point. Interviews were conducted with the teacher Branislav Jovanovic and his students from a high school specialized in agriculture in Futog. The main questions addressed were related to their professional specialization, additional workshops and seminars, trainings on ICT in agriculture and new equipment. After further analysing their needs, PA4ALL better understood the urgency of implementing ICT in the educational system of Serbia.

Secondly, PA4ALL reached its network of innovators (farmers, SMEs, entrepreneurs) and asked them to provide their professional opinions on how schools specialized in agriculture could better address the current needs of the market and create better professionals in the field.

The analysed data helped us to determine what are the crucial needs of schools to develop their curriculum activities and introduce new aspects in agriculture education.

- Main outputs and results

The results of a comprehensive desk research, interviews with students, teachers, government representatives and relevant actors from the ecosystem (i.e. farmers, startups and SMEs working in the field of precision agriculture) confirmed our initial hypothesis that there was a significant mismatch between the demand for ICT skills in agriculture and the education students in high schools specialized for agriculture receive. Namely, our context analysis provided us with the following information:

1. Agriculture is not an interesting field for young people

When looking at national high school enrolment statistics in Serbia, there is a significantly lower number of students applying for schools specialized in agriculture. When compared to other high schools, those specialized in agriculture attract only 6% of yearly applicants, while gymnasium enrolment is 26%, IT schools' enrolment 11% and economic/law high schools' enrolment is 13%. Furthermore, when talking to students we learned that among their peers they are seen as less successful due to the low interest in schools of this profile.

2. ICT skills are essential in today's work in the field of agriculture

The positioning of BioSense as a focal point for the agrifood ecosystem in Serbia gave us valuable access to innovators and practitioners in this field. They all confirmed that new generations either

lack interest in agriculture or the ICT skills this field demands today. Specifically, most practitioners pointed in the direction of Big Data as a key tool for addressing the challenges in agriculture. The advent of the Big Data era, spearheaded by Copernicus' free, full and open data policy opens an immense opportunity for the development of innovative services and products in the field.

3. There are ongoing policy changes supporting the digital transformation in Serbia

In recent years, Serbia has been committed to advancing digital technologies in different fields, as well as creating an enabling environment for digital innovation. For that reason, several policy documents were introduced: Digital Agenda for Western Balkans, 2020 Strategy for the Development of Information Society in Serbia. A witness to this transformation is also the formation of several bodies such as ICT Clusters, Digital Serbia Initiative working towards necessary policy and educational changes. Furthermore, an innovative initiative Petlja dedicated to creating a new curriculum for ICT in primary schools has shown that over the course of a couple of years it is possible to train teachers to use online tools for teaching ICT relevant for today's market.

4. There is no ICT education in high schools

Both teachers and students pointed out that there was currently no syllabus supporting ICT subjects in schools specialized in agriculture. They expressed interest in being more connected to market demands and emphasized that they lacked relevant courses that could support that.

Compiled outputs pointed us in the direction of finding connections between ICT and agriculture and focusing PA4ALL efforts on this.

*(See pictures in annex II p. 30)*

*Table 31 Synthesis of PA4ALL*

| | |
|---|---|
| Theme | ICT in agriculture, innovative learning methods, different trainings and importance of Big Data and precision agriculture for the today's agriculture sector, new professionals in agriculture |
| Needs | The introduction of ICT subjects in agriculture courses, inclusion of ICT in schools specialized in agriculture, increase the awareness of the relationship between technology and agriculture |
| Key evidences | After conducting the interviews with the relevant actors, we understood that the curriculum does not support the subjects related to ICT in general, nor do the school facility infrastructures support the implementation of ICT.<br>Also, despite recent increase in the number of young people engaged in agriculture, Serbia still lags behind the countries in Europe. In the European Union, young farmers account for 8% of the total number of agricultural producers. In the Czech Republic and Poland, this percentage is even higher. In Serbia, however, less than 5 percent of young people are engaged in agriculture. One of the key evidences supporting our challenge are statistics on low enrolment in high schools specialized in agriculture mentioned earlier in this chapter.<br>Additionally, policy documents (i.e. strategies on digital transformation) were used as key evidences from one side of the market and outcomes of the interviews with the innovative community agtech and foodtech pointing out the importance of ICT skills for future agriculture from another.<br>However, one of the most important evidences supporting our decisions are the interviews with the teachers explaining the challenges schools specialized in agriculture face. |
| Main policy context elements | 1. National policy spearheaded by the prime minister Ana Brnabic holds ICT development as one of its core priorities<br>2. Serbia is a part of the Digital Strategy for Western Balkans<br>3. There are several policy documents (i.e. strategies mentioned in section 1.1.1) creating an enabling environment for education in ICT<br>4. Formal and semi-formal bodies who focus on lobbying for advancement in ICT have been formed in recent years (i.e. ICT Clusters in cities around Serbia, Digital Serbia Initiative)<br>5. 5A successful program of introducing ICT in primary schools through and online platform has been implemented by Petlja paving the way for similar efforts in other fields such as agriculture |

### 5.1.2. Phase 2: Reframing the problem

- Process and methodology

The first established contact with schools around Serbia was at the Science Festival at the University of Novi Sad. The aim was to welcome the students attending schools specialized in agriculture to provide their ideas on new prototypes which could be developed, and which would help in solving some of the issues related to agriculture. After the ideas were presented at the science festival, which took place from May 18th until May 19th 2019., the best idea was selected and awarded with equipment which will bring ICT closer to students. The idea selected was the "SPRAYCONDI- digital advisor for the reduction of errors in the application of pesticides" by the high school specialized in agriculture from Futog (suburbs of Novi Sad). "SPRAYCONDI" would help the farmer make the right decision regarding the reduction of drift and more efficient pesticide application, measurement of meteorological data at the site where the pesticide application is performed. The digitized data would also be transmitted via mobile network to a cloud or computer where a model for the impact of the pesticide application on biomass and the final yield will be generated. This data was supposed to be obtained at the meteorological stations on a regional level, which is why we decided to provide the meteostations to schools, so they could obtain the data locally form their own sources.

The farmers community around BioSense provided information on activities which are necessary in order to improve the ICT-based knowledge inside the farmers community in Serbia in general. During the Annual ANTARES Workshop which was held on from April 3rd until April 5th, AgroSense – BioSense platform was presented and the main services it provides to farmers which were invited to the Workshop. We took the opportunity to consult the users (farmers) and other stakeholders regarding our plans for the SISCODE project and the idea of improving the educational system in agricultural specialized schools was strongly supported. The farmers gave us advice on how to structure our ideas regarding the needed equipment, how to address the students who are studying agriculture and they pointed out how important it is for young professionals in the agriculture sector to use novel technologies such as the AgroSense platform, Big Data from meteostations, and other.

An additional source of information about the needed activities in schools which will improve the education of future professionals in the AgTech industry was our BioSense network, which comprises of SMEs and start-ups. Since most of the entrepreneurs belonging to the network have a background in agriculture and ICT related sciences, they were an excellent reference point to suggest relevant changes and new ideas regarding the educational system. Our reference point from this network was Milan Dobrota, the founder of Agremo, an AgTech start-up specialized in agricultural sensing and drone analysis platform for drone operators, growers, and agronomists, which provides actionable insights that lead to sustainable production, higher yields, and lower production costs. Milan Dobrota PhD is an entrepreneur with a background in electrical engineering, who started his own startup a few years ago and he backed co-creation ideas with great enthusiasm.

Since BIOS Institute is involved in multidisciplinary research performed in the fields of micro and nanoelectronics, communications, signal processing, remote sensing, big data, robotics and biosystems we consulted the research groups on what kind of help can be provided to high schools specialized in agriculture in order to prepare its students for the future labor market. Remote sensing and GIS group gave us an excellent reference on which equipment we should provide to schools in order to help them learn more about the popular concept of Big Data analysis, which could be applied to agriculture as well. Since this group bases its research on processing, storage and retrieval of data acquired from multimodal sensors, and integration of large amounts of multimodal data acquired from different, the idea of organizing trainings in high schools was born. The activities of the group include the development of systems for instant access to relevant data presented in ways which are the most informative to end-users, such as GIS databases, which could be interesting to future professionals in agriculture.

- Main outputs and results

The joint effort of involving different stakeholders demanded individual approached. For understanding the broader context and current policies relevant for the challenge we consulted relevant actors from the governmental and civil society sector. Here, individual consultations with a representative of Digital Serbia Initiative pointed us in the direction of capitalizing on the ongoing national efforts of bringing ICT education to schools. Furthermore, consultations with a representative of Petlja (an initiative that has implemented ICT education in primary schools through a free online platform) showed us the importance of training the teachers who will be responsible for bringing the ICT competences to the students.

When talking to the innovative community involved with precision agriculture in the region, we learned that the skills the students need should be related to data analyses that can be applied in different aspects in the field. Both the consultations with the farmers during the ANTARES Workshop, and individual consultations with entrepreneurs within the agrifood value chain addressed the importance of ICT skills in modern agriculture.

For understanding the needs of students in the selected schools we organized an ideation workshop and gathered their input. Here we learned that it would be insufficient to train the students to use a specific software when their schools lack basic scientific equipment. Having learned that we went back to BioSense and after several consultations with the management and research departments we came to the solution of acquiring both modern equipment and organizing trainings for the students and the teachers for analysing data coming from the equipment.

Finally, putting the challenge in the context of climate change and its effect on agriculture and listening to the student suggestion from the Science Festival challenge, e we came to the conclusion that the best equipment for the pilot were meteostations that will be monitoring weather conditions. *(See pictures in annex p. 30)*

*Table 32 PA4ALL key stakeholders*

| Main Stakeholders | Main interests in SISCODE's pilot |
|---|---|
| Students and Teachers from high schools specialized in agriculture | Providing their opinions on the major deficiencies of the educational system at the moment, providing new ideas on ICT in agriculture, improving the infrastructure of schools, etc. |
| Policy Makers | Improving the policies, laws and regulations connected to the educational sector, how curriculums could be enriched, new equipment acquired for the needs of better education in Serbia |
| Farmers | Information on the market and which kind of problems do professionals encounter on the market and how can it be improved |
| The scientific community(Researchers from BioSense) | Ideas on the most important aspects in the field which should be presented in schools, Knowledge transfer to teachers, students |
| The Innovative Community (SMEs and AgTech start-ups) | Providing ideas from an ICT perspective, new market trends, what kind of professionals lack on the labour market, etc. |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 33 PA4ALL Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | Identifying aspects that are lacking in high schools specialized in agriculture that would enable students to innovate and develop new solutions for future agriculture, become more competitive in the market and secure employment. |
| Synthetic formulation of the reframed challenge. | Identifying ways of introducing ICT in high schools specialized in agriculture in way that fosters the development of specific skills, greater connection to market needs and relevance for agriculture of the future? |

### 5.1.3. Phase 3: Envision alternatives

- Process and methodology

Another contact with the students from the high school specialized in agriculture from Futog was at the Workshop organized by PA4ALL on the 31.5.2019. The main topics discussed with the students were types of agricultural data which could help them to understand better the yields, meteorological and weather conditions which determine the agricultural production. It was explained to them how they could collect and analyse these types of information in order to enable the practical application of data and demonstrate strong interest in the subject.

- Main outputs and results

From this Workshop we concluded that introducing precision agriculture tools in high schools specialized in agriculture and uptake of innovation is crucial for the future development of ICT science in agriculture. This also relates to the notion that the younger agricultural household members are a demographic group that has demonstrated higher adoption rates of technology. Therefore, we concluded that they are a solid test-bed for further co-creation and knowledge-transfer activities and this idea will have a long term positive impact.

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 34 PA4ALL ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Green Farm | Sustainability | Sustainable | Sustainability, Originality | Coherence (out of context for precision agriculture in high schools |
| Student farm | Real life context | Sustainable | Shared value, opportunities | Not original, does not focus on ICT use, already existing in schools specialized in agriculture |
| ICT lab for school | Real life context, Introduction of PA in Agriculture | Process Innovation | Original, bring now opportunities, Scalable, Innovative, coherent idea | Engagement (it will be necessary to work actively on engagement of stakeholders) |

## 5.2. The selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| ICT based education in high schools specialized in agriculture |

# What?

Description.The main goal of the Lab is to provide equipment to students which will enable them to gain crucial agricultural parameters. After conducting desk research and interviews with the stakeholders, PA4ALL concluded that the best solution would be to provide meteostations to schools, since they usually have their own piece of land on which the stations could be used. The school which was selected for prototyping was the one with the best innovation idea - the agriculture specialized school from Futog will be receiving both the meteostation and supporting equipment and workshops. The meteostations will provide information such as soil humidity, air temperature, precipitation amounts, air humidity, wind direction, etc. At the moment, the curriculum in high schools specialized in agriculture does not support these kinds of activities and therefore, students lack the crucial knowledge to implement ICT. Since they will lead the agricultural industry in 5-10 years it is very important to introduce future professionals with principles related to community-driven development and citizen science as early as possible.

# Why?

The introduction of ICT subjects in high schools specialized in agriculture and inclusion of younger generations will increase the awareness of the relationship between technology and agriculture and therefore make agriculture more attractive to younger generations. Also, socially speaking this initiative will create more professionals on the market which will consequentially improve the economy and therefore the society itself.

Additionally, co-creating will bring both direct and indirect benefits on a country level. Indirectly, due to the existing governmental strategies which are addressing the existing policies that incentivize the implementation of ICT in education in Serbia (Digital Agenda) we could expect more innovation and mind set changes on a society level. Directly, co-creation activities will bring positive examples to the policymakers on how the curriculum in schools could be improved and how the society reacts to educational system reforms. Therefore, it will trigger a set of indirect benefits such as digitalisation on a larger scale, not only in agriculture.

# How?

**Activities:** The prototyping phase will be divided in several stages, starting from September 2019. First decision being made for the prototyping phase was the selection of the school which provided the best idea on how to improve the ICT inclusion in their curricula, with the students' involvement. After choosing the school which will test the prototype, PA4ALL decided to start with equipping the school with the following equipment: meteostations, computer, printers, solar energy panel and other supporting equipment.

Furthermore, PA4ALL will be providing supporting trainings on how to use the meteostations, trainings on creating GUI software, trainings for SNAP and QGIS, trainings on how to read and analyse the data and find correlations between the data and optimal agricultural decision, access to AgroSense (an internal platform of BIOS) and other.

The services AgroSense will be useful to schools since they will be able to see how a similar technology looks in practice. AgroSense has an option of mapping the parameters of the farm, with an option by which the images from the drones (RGB, NDVI etc.) can be placed on the desired production plot, the maps of the conductivity of the soil obtained by the electro-magnetic probe, the yield maps of the combine and any other georeferenced images.

**Main stakeholders and responsibilities:** Phase 4 will be monitoring and analysing the work done in Futog, through obtaining constant contact with the teacher Branislav Jovanovic from the school in Futog. PA4ALL plans to organise additional Workshops where students and teacher will be invited together with the stakeholders and policy makers so that they could exchange experiences, information and challenges which this project encountered.

**Budget:** The provided budget of 15.000 EUR is set for the equipment supply and for the training, specialization and educational purposes. Prototyping (Phase 4) will start in September 2019, by applying it firstly to the school whose idea was selected, high school specialized in agriculture from Futog and afterwards to other 50 schools around Serbia.

**Data collection:** The mechanisms for measurements and data collection will be set in the accordance with the tools designed by the project management, such as constant monitoring and supervision. Also, with regards to the prototype, the data measured will directly address the agriculture production success rate, which will also be done with in cooperation with students.

# When?

The prototyping phase is set to start at the beginning of September 2019, when the new schools year starts. The plan is to prototype during the first half semester (September 2019.-December 2019.). The experimentation phase is envisioned to take place during the second half semester (January 2020.-May 2020.)

**Times scope**

| Month | Sept 2019 | Oct 2019 | Nov 2019 | Dec 2019 | Jan 2020 | Feb 2020 | Mar 2020 | Apr 2020 | May 2020 |
|---|---|---|---|---|---|---|---|---|---|
| Prototype | | | | | | | | | |
| Experiment | | | | | | | | | |

# Comments

The only risk PA4ALL might encounter the lack of interest on the students' behalf. This can be resolved by engaging larger number of the students, which is what we aspire to do. After the prototyping phase is done we will show the potentiality of the solution to other schools and to policy makers, which will attract further interest in this action.

*Please see Annex II p. 31-32 for the complete description of the idea canvas and the Experimentation Canvases.*

## 5.3. Policy Making in the implementation of the co-creation journey

- Getting to know the local political context better.

The political context in Serbia in the past decades had brought a lot of turbulence to the society followed by frequent changes in relevant governmental institutions. Furthermore, as a society in transition, Serbia is facing the challenge of keeping up with the global challenges lacking the necessary technology and industry that would enable this process. However, previous socialist legacy provides Serbia with quality education in engineering professions, primarily electronics and mechanical engineering, It is exactly these fields that have in recent years become the pioneers of change influencing both policy and market and bringing ICT to the forefront of Serbia's export potential, talent pool and educational opportunities. A recent study conducted by the German-Serbian Chamber of commerce confirms that ICT is the fastest growing sector in the Serbian economy.

Given these developments, local policy context has also been changing. Traditionally, the lack of democratic institutions has led to a lack of bottom-up initiatives and little understanding for the co-creation process when talking about new initiatives and changes in the system. However, the growing potential of the ICT sector has led to the development of organizations and institutions with a common goal of working towards changing the institutional framework to increase the potential of the sector. ICT Clusters representing a group of companies, SMEs or start-ups formed in cities such as Novi Sad, Subotica, Nis, Belgrade and many others. Digital Serbia Initiative brings together banks, media companies, ICT companies, phone operators and acts in their best interest working on necessary policy changes.

In agriculture, more traditional approaches to policy are deployed. Most farmers form cooperatives and use these structures to influence crop prices, gain greater bargaining power when negotiating with the state, influence subventions etc. In this field, compared to ICT, serious co-creation and bottom-up policy initiatives have not yet happened.

As PA4ALL works at the intersection of the two respective fields, the assessment of the policy context through initial desk research as well as previous presence in the community directed us towards working more through the ICT community. Capitalizing on the current digital strategies, bottom-up initiatives and potential of ICT for Serbia's development, we focused our policy efforts here.

- Engagement with policy makers

Thanks to the well-established presence of PA4ALL and BioSense in the ecosystem, connecting with policy makers was initiated through previous collaborations and well-established connections. Working with multiple stakeholders and relying on the demonstrated success of previous projects has led to a positioning of the BioSense Institute as a central point for innovation in agriculture. Using this as a starting point, the initial contact with policy makers was done through the presence in the network. As members of the Digital Serbia Initiative we gained insight into the most recent policy developments and strategies shaping Serbia's digital agenda. It was here we got valuable advice on moving forward with educational changes. We engaged them by organizing meetings and interviews collecting valuable input for the future steps of PA4ALL.

A lack of trust in institutions and a feeling of powerlessness when it comes to changing the educational system was a sentiment we often encountered. Talking to teachers and students we often got a response that it was nice that we wanted to conduct the project and support them, but that they couldn't see a potential of scaling that to structural changes in the educational systems. Also, reaching governmental representatives responsible for the curriculum was challenging and is a task that we will continue to work on in the following months.

- About the policy gaps and suggestions:

*Table 35 PA4ALL: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| **School curriculum**<br>- There are no current efforts or strategies in place aimed at improving the curriculum to match the potential of agriculture using ICT | - Using the current efforts of Petlja that is introducing ICT in primary schools through an online platform and expanding this to high schools specialized in agriculture<br>- Working with the interested in teachers in adapting their current subjects to the needs that agriculture today demands |
| **Access to technology**<br>- Schools face challenges in getting the necessary equipment related to the use of ICT due to a lack of financing | - Collaborate with the relevant SMEs, institutions and companies who could donate equipment to the schools |
| **Access to information**<br>- Teachers are not trained in using the newest technology and cannot transfer this kind of knowledge to students | - Establish collaboration mechanisms between high school teachers and researchers at BioSense who could transfer their know-how and train the teachers in using the most recent technology |
| **Mismatch between market and education**<br>- Current educational curriculum is not adapt to the needs of the market | Establish partnerships between innovative startups, SMEs, companies and other institutions in the field where students could do internships and receive hands-on training |

- Future actions and suggestions for WP4 workshops

So far, the efforts of PA4ALL have been focused on understanding the local context and potential for implementing precision agriculture in high school education in Serbia. For this reason all the outcomes are related primarily to the pilot and we cannot provide inputs for other levels of action taking. However, we do forsee that we will have more information as the process evolves.

However, as co-creation was proven as a process of significant value, connecting actors, creating synergies and joint values PA4ALL will be promoting the idea of co-creating to policy making during both international and national workshops.

## 5.4. **Monitoring of the process**

- Synthesis of the activities

*Table 36 Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | Desk Research<br><br>Synthesize & analyse data | Desk research<br><br>Public events<br><br>Large audience events<br><br>Data Analysis<br>Evaluation | Outline of the local challenge<br><br>Outline of the perspectives of key stakeholders regarding the challenge<br><br>Report on the data collection with recommendations | 2<br><br>1 | >20 interviews conducted with researchers, farmers, AgTech start-ups, policy makers<br><br>Conducting interviews on events such as the annual ANTARES workshop, The Festival of Science etc. |
| Phase 2 | Reasoning with analysis of the context<br><br>Aligning the lab concept with knowledge gathered | Analytical thinking<br>Analogous models<br><br>Comparative analysis | Outline of the clear vision of the local challenge<br><br>Report on the chosen local challenge | 1<br><br>1 | Understanding the most important aspect to address regarding the implementation of ICT in schools specialized in agriculture.<br><br>Identifying the action plan in accordance to the established goals |
| Phase 3 | Ideas generation<br><br>Idea selection | To garnish plausible ideas<br><br>To select the appropriate idea | Cross fertilizing knowledge, ideas, findings<br><br>Analysis ideas generated<br>Idea card<br>Concept sorting<br>Concept evaluation | 15<br><br>12 | Refining the ideas and choosing one of the few selected paths to follow<br><br>Starting by evaluating the most effective solution and establishing the steps |

*Table 37 PA4ALL Stakeholder engagement*

| Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|
| | Co-producing | Co-designing | Consulted | Informed | |
| Business Development Department (BDD) | ☐ | ☒ | ☒ | ☐ | No changes |
| Students | ☐ | ☒ | ☒ | ☐ | No changes |
| Local officials and governmental bodies on a regional level | ☐ | ☐ | ☒ | ☒ | No changes |
| Ministry of Education | ☐ | ☐ | ☐ | ☒ | No changes |
| Media/wider public | ☐ | ☐ | ☐ | ☒ | No changes |
| Parents Advisory Board | ☐ | ☐ | ☐ | ☐ | The students are the ones who choose whether to engage in learning about ICT or not, therefore the experiment needs only support from the Parent Advisory Board |

# THESS-AHALL

Exploring

Social inclusion, participatory research,, inclusive co-creation activities, Active citizens open Academia, sense of belonging

## 6. THESS-AHALL journey

THESS-AHALL aims to fight the risk of loneliness and ageism while increasing the social inclusion in the ageing population and chronic patients, by opening the "University's doors" and using co-creation, open science and social research as its means.

More specifically, older adults (people over 60 years old) and chronic or institutionalized patients (people who receive residential care) often feel like marginalized and inactive citizens, due to their retirement or because they experience the cultural stigma of losing their mental and physical abilities. To this end, older adults and chronic patients tend to spend their day mainly with other patients or people at their age, feeling socially isolated and inactive citizens. Meanwhile, the general public lacks awareness of those people's needs and problems, contributing even unintentionally to their marginalization.

Within the SISCODE experimentation context, THESS-AHALL's big challenge is to break the social exclusion walls and welcome chronic disease outpatients, as well as older adults, back to the community, introducing the "Participate 4" life-long learning programme: a series of co-creation research activities in the Living Lab and the Aristotle University of Thessaloniki, during which older adults and chronic patients will cooperate with the R&D community of the University as other scientists, "partners of life"/ "partners/researchers of experience". The main objective of these activities is to enhance the competences and knowledge of the challenge's beneficiaries, through their active involvement in participatory research and the co-designing of their own solutions or by imposing of their own research questions for key-problems they face in terms of health and well-being. To this end, these population groups will feel again active and socially included citizens, while their interaction with researchers, university students and other stakeholders will help them raise awareness of the society over their needs and problems. The participants will also have the opportunity to take over the responsibility of co-ordinate co-creation sessions, with THESS-AHALL's support and experience the co-creation research methodology at its core.

The activities will vary from participation in co-creation sessions in the framework of other research projects of the THESS-AHALL to lectures of older adults and patients to students, sharing their experience and knowledge of participating in Lab's activities, facilitating of co-design activities, in cooperation with researchers of the labs, as well as awareness campaigns for health and well-being issues, co-organized and implemented by both older adults/patients and Lab's research staff.

To sum up, by using the phrase "From Science in Society to Society in Science" as a starting point, THESS-AHALL aims to give older adults and chronic patients the floor to become alternative scientists and equal partners of the Living Lab, being informed about the research, offering their valuable help to the Academia, expressing their needs and problems and co-finding solutions for them.

## 6.1. THESS-AHALL's journey implementation

### 6.1.1. Phase 1: Analyzing the context

- Process and methodology

THESS-AHALL's challenge stems from its **many-year experience in research with end-users**, and especially with older adults and other vulnerable populations, like chronic patients (e.g. Persons with dementia, Persons with Down Syndrome/Autism, mobility problems, cancer, heart disease patients etc). THESS-AHALL's experience in collaborating with these populations have shown that as science and technology have an increasing impact for the society and citizens, an inclusive and more accessible scientific community, which would be in-line to the democratisation of research and the high involvement of citizens in co-creation research and decision-making, could be a vehicle for socially excluded populations to feel active and self-confident again.

To enhance its empirical knowledge and find solid ground for its research hypothesis, the THESS-AHALL conducted an in-depth research to collect both quantitative and qualitative data, using both **"keyword bibliometrics"** (desk research on ageism, social exclusion, the cultural stigma and the "openness of the Academia"), **"field visit"** (the Academia as a social/open community), **"research planning survey"** (monitoring of stakeholders participation and satisfaction in preliminary short-scale activities), **"interest group discussions"** (focus groups with professional stakeholders from the healthcare sector) and **"interviews"/"questionnaires"** (with the primary beneficiaries: older adults and chronic patients).

- Main outputs and results

Although poor in data for the local, Greek context, the desk research provided valuable data for ageism and the risk of marginalization of chronic patients. Bibliographic research has shown that ageism and chronic diseases can coincide social isolation and loneliness (Cantarella et al., 2017), which could lead to serious mental damage, including anxiety and depression. Moreover, the EU has included loneliness among the rising challenges that the European older adults' population faces, in terms of individual's well-being and social cohesion. Also, the UN and the WHO have raised concern on the active ageing by setting policy frameworks and action plans since 2002. On the other hand, the diagnosis of a chronic disease can significantly affect the everyday life of patients, not only in terms of ongoing medical management and the potential physical and mental problems that may be caused due to the disease, but also to individual's psychological, social and physical life (Kaushansky et al. 2016). The impact is higher when the alteration in everyday lifestyle is accompanied with the experience of potential stigmatization, social discrimination (avoidance or rejection). According to Maffoni et al. (2017), the experienced cultural stigma is linked to "a complex experience concerning a devaluating, discriminant, and discomfort feeling" for the individual.

Interest focus group discussions and interviews with healthcare professionals, experienced in working with older adults and chronic patients (psychologists, doctors, nursing home staff, physiotherapists), older adults/outpatients and family caregivers confirmed the desk research on ageism and the cultural stigma at the local context, emphasizing on the need for inclusive activities for these populations and their welcoming back to the society (see the Annex II p. 34).

Concerning the "openness" and the "accessibility" of the Academia, the desk research provided only few qualitative data and some views on the issue, derived from popularized articles in the science magazines/media (popular media scan matrix). The scientific society is a community usually considered as "close" and inaccessible to the general public; older adults and chronic patients included. The scientific community has many times been accused of conducting "research just for research" and not for the society and the commonweal. In several cases, the research community fails to transfer its knowledge and outcomes in a simple language to the public, cultivating an ever-increasing communication gap. Faced with this reality, there are many supporters and devotees,

coming from Research, who side for the bridging of the communication gap between the scientific community and the society, as well as for an Open and participatory Academia, based on the principles of the democratization of science, including co-creation and RRI. EU and global initiatives, like the European Commission's Open Science Goals of Research & Innovation Policy, the European Open Science Cloud (EOSC): policies, annual progress report, the OpenAIRE: Transform society through validated scientific knowledge, the Citizen Science Hub for the involvement of the general public in scientific knowledge production etc., prove the importance of extroverting research from the closed and sterile scientific laboratories to the society. To support these findings at the local context, the THESS-AHALL research team conducted a "field visit" by participating and observing beneficiaries' behaviour and activity in the "Open neighbourhoods of Science" initiative by the Aristotle University of Thessaloniki and the Municipality of Thessaloniki. In this framework, citizens of every age attend open lectures and workshops on scientific issues, applied in a simple way to everyday life aspects and problems, designed by academics and young researchers of the university in seminar rooms, in open places in the centre of the city, in the Town Hall (a summary of the desk and survey planning research on the "openness" of the Research Community is depicted in the researchcommunity_infographic2 in the Annex II p. 34.

The field visit and a number of "research planning surveys" -interviews, questionnaires, even observation- to monitor the participation and satisfaction of older adults and chronic patients in THESS-AHALL's short-scale co-creation activities, confirmed the hypothesis that open and participatory research can be a motivation for older adults and chronic patients to get involved in public activities and feel active and more self-esteemed. The interviews with chronic patients (the Parkinson's Association of Northern Greece) and family relatives (parents of Persons with Autism) showed that inclusive/participatory activities with researchers of the Living Lab make them/their children feel not only socially included and accepted, but also useful for research, since they have the floor to share their thoughts and needs and contribute to the design of new solutions. On the other hand, satisfaction questionnaires and observation, during co-design sessions and co-creation activities of THESS-AHALL's older adults' "Collaboration & Research Community for the Independent Living", provided useful information on how participants over 65 years old perceive their role and participation in the Living Lab: self-descriptions like "co-partners", "ambassadors", "long-life learning students" etc., strong expression for continuous engagement in Lab's activities and acknowledgements to the research team for treating them like equal partners of each research attempt and not as temporary assistants to their scientific work.

Moreover, older adults positive commented that through their participation in Lab's activities, they receive an alternative life-long learning education, while for most of them, it is the first time they visit the University premises and associate with the Academia. A special badge, like an alternative "student ID", has been handed out to all the members of this Community, enhancing their "sense of belonging" in the team. Participants in the Community of the THESS-AHALL express their views on issues of their daily life, regarding well-being and health problems and try to co-design the technological and non-technological solutions they need, along with researchers, to benefit not only themselves, but also to help other people, facing similar problems.

*Table 38 Synthesis THESS-AHALL*

| | |
|---|---|
| Theme | **Key themes:** ageism and the risk of social exclusion of older adults and chronic patients, "From Science in Society to Society in Science" **Key words:** social inclusion, participatory research, open Academia, inclusive co-creation activities, "partners/researchers of experience", active citizens, sense of belonging |
| Needs | -To listen more to beneficiaries' needs (what they want, what they need), to give them the floor and to trigger them to co-design solutions -To measure their engagement in research and how they feel about their participation -To eliminate the "us"-"them" relationship in research -To show them "what's in it for them", when participating in research -To include them in every step of the research activities, just like being equal partners, other scientists. |
| Key evidences | -Ageism and the cultural stigma of chronic patients exist. -People over 65 and patients often experience loneliness and social rejection, feeling inactive citizens, since it is more likely for them not to participate in social activities anymore -The RRI and co-creation are two key principles for research and the academia to become more "accessible", setting the citizens and the society on their forefront ("science for the society") -The active participation/engagement in co-creation research activities and the association of citizens from sensitive population groups with researchers could be a means of socialization, motivation for action and social inclusion, as active citizens who contribute and offer to the Academia and the society through their experience, views, ideas ("partners of experience"), as well as receive personal benefit by co-building solutions for their problems and learn new things (lifelong learning). |
| Main policy context elements | **General Context:** There is no specific social policy or a Ministry responsible for fighting ageism and risks of social isolation of older adults and chronic patients in Greece that is universally implemented at the national level. There are several established national frameworks, regarding the provision of welfare and insurance allowances, medical coverage and other everyday living needs (most of them aligned to the EU healthcare policies for older citizens), but not at the level of social inclusion and the elimination of social discrimination in the targeted population. The implementation of social actions for older adults and chronic patients' inclusion is at the discretion of each municipal authority. The local authorities they do not universal social action plans, so that the targeted population to have equal access to the benefits of social inclusion activities. There is no central social design and the existing inclusive structures and activities are the product of short-term decisions/parameters. A remarkable example of social policy for older adults in Greece is that of the Greek Inter-municipal initiative for Health Promotion, which has established since 2015 some general guidelines on the Active & Healthy Ageing of citizens -based on the EIPonAHA principles- including educational programmes for older adults (computers skills, foreign languages etc.), as well as entertaining and cultural activities, ageing tourism etc. However, the guidelines provided by the Network do not have universal power at the national level and each municipality is free to decide if it will adopt all/some/none of them, as well as to decide on the duration of the programmes and their reimplementation every year. Moreover, the national Manpower Employment Organization has established some subsidized programs for the employment or entrepreneurial activity of people at the age of 55-64.<br>**List of existing individual initiatives/good practices on social inclusion:**<br>- Public policies for older adults: Day care and activity centres for the older adults (offering activity programmes, like sports, entertainment or educational seminars). The "Help at Home" (Municipal Programme). Benefits/incentives for the elderly (free pass for the public transportation/ museums/ theatres). Resilient Thessaloniki municipal initiative (public transportation, mobility of people with disabilities);<br>- Policies for chronic patients: Greek federation of patients (a patient associations' joint force), regional or national Patients' Associations (Alzheimer's Association, Parkinson's Association);<br>- Policies derived from the Private sector: insurance companies' programmes for older adults or chronic patients, private rehabilitation centres, Onassis & Niarchos Foundations' funds for research on special target groups. Corporate Social Responsibility initiatives: e.g. SKAI TV computer training programmes for the elderly, "Lidl Hellas" Healthcare/volunteering programmes (cooperation with sponsors);<br>- Awareness campaigns: online campaigns or campaigns published in the media, concerning the "safe" internet, new technologies, assistive technologies for older adults |

### 6.1.2. Phase 2: Reframing the problem

- Process and methodology

The THESS-AHALL's first approach for the SISCODE challenge was to break the social exclusion walls and welcome institutionalized and chronic disease outpatients, as well as older adults, back to the community, introducing the "Participate 4" campaigns. Within the "Participate 4" context, older adults, chronic patients and people from other vulnerable groups would be motivated to participate in social awareness campaigns and co-creation research activities "with" and "for" people who experience social exclusion because of being institutionalised patients or older adults receiving residential care. THESS-AHALL's community of end-users would donate its time to participate in joint actions with these people, who would not just be spectators, like in other donation campaigns, but active participants, who would feel socially included again. Additionally, the participation would be turned into points that would be translated to a symbolic donation for the joint, pre-determined purpose. THESS-AHALL conducted some **discussions** with the SISCODE consortium, a series of **focus groups** with experts from the healthcare sector (6 psychologists, 4 doctors, 2 physiotherapists, 2 nurses), experienced in working with older adults and outpatients, interviews with outpatients who had a previous similar experience, co-organizing such events with the THESS-AHALL and some **in-person discussions** (Parkinson's Association of Northern Greece, Family members and staff from the "Spring Children" Association of Persons with Autism and other Developmental Difficulties) with organizations and private bodies (PAOK F.C., Telloglion Fine Arts Foundation), who would possibly donate the symbolic gifts for the campaigns, presenting the entire idea.

- Main outputs and results

From the **in-person discussion** with organizations like the Telloglion Fine Arts Museum of Thessaloniki, which was interested to host a series of social awareness "Participate 4" campaigns and Greek Superlegue Champion PAOK FC, which was positive to sponsor such kind of events, a positive view over the idea was concluded. **Interviews** with patients from the Parkinson's Association of Northern Greece, who had the experience of a participatory awareness campaign, co-designed with THESS-AHALL in the central square of Thessaloniki in 2017, were also positive for the idea of the "Participate 4" campaigns and the donation of time and points. The said that the 2017 event, was the most successful campaign they have ever had for the International Parkinson's Day. Similarly, to the Parkinson's disease patients were the comments of the "Spring Children" Association parents with children with Autism, mentioning that their experience from the open street campaign was unique, since their children had the opportunity to interact with other citizens and children from typical schools, who participated and were aware of the Association and their children's needs and specialties.

However, healthcare professionals suggested that the social exclusion is an extremely large-scale issue, which is difficult to be approached through a series of social awareness campaigns and exceeds the experimentation scale of SISCODE. Professionals emphasized on the short duration and the temporary benefit that such kind of initiatives usually have, and along with SISCODE partners, recommended that the challenge should focus on the co-creation activities in which older adults and chronic patients participate in the Lab, and also to find "what is in it for them" as members of the "Collaboration and Research Community for the Independent Living" of the Lab, and not how they could help other potential beneficiaries. Working with these people to find solutions for their needs and problems, welcoming them back to the society as close collaborators in research, could benefit them, feeling active citizens and socially included again.

*Table 39 THESS-AHALL key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| Citizens (older adults/ chronic patients) | They are the primary stakeholders of the challenge, the main beneficiaries. Active involvement in every stage of the challenge, engagement of other people, to spread the message of co-creation, to share their knowledge and experience, assessment of their participation in research and if it helped them to feel socially included and active citizens. | To tackle the social exclusion and loneliness through their active involvement of every stage of the challenge, co-designing, implementing and disseminating participatory research, based on their needs and views. |
| Experts (doctors, healthcare professionals, cargivers) | Consultation and reframing of activities and the main objectives of the challenge. Their involvement and experience are crucial in order to recognize the needs and the problems of the primary stakeholders, to motivate their participation in activities valuable for them and to map the social exclusion and the cultural stigma over specific sensitive populations. | To find new approaches for tackling social exclusion and motivate older adults and patients to be engaged in social activities, enhancing competencies and their self-confidence. |
| Civil Society (patient associations, day care centre organizations) | Their experience is significant to map the social isolation and the cultural stigma phenomena, experienced by chronic patients, as well as the kind of inclusive activities they would possibly like to participate. | Patient associations could have the interest of participating in co-creation and being integral part of the challenge, increasing their self-confidence and feel active again. Organizations and NGOs could possibly find new ways of engaging their beneficiaries in participatory, social activities, also taking the advantage of collaborating with researchers. |
| Policymakers | Active participation of the local authorities in joint co-creation activities and support of the democratized research for the benefit of the society and its citizens. The Academia to recognize and adopt the value of participatory research for the society and to open its doors to the citizens, as partners and not as subjects. | Both the political authorities and the Academia could be benefited by a "win-win" collaboration of citizens and researchers, in order to make value for the society and to increase the impact of research for the commonweal. |
| Scientific & Research Community | The closest collaborators of the primary stakeholders, supporters and motivators in every step of the co-creation activities. Also, the "voice" of the University to promote its accessibility and to motivate the adoption of user-centred and co-creation methodologies. | The scientific community will not be considered as a "close" entity anymore and researchers will take the advantage of their collaboration with end-users, citizens themselves. |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 40 : THESS-AHALL Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | THESS-AHALL's big challenge is to break the social exclusion walls and welcome institutionalized and chronic disease outpatients, as well as older adults, back to the community, introducing the "Participate 4" campaigns. |
| Synthetic formulation of the reframed challenge. | THESS-AHALL's big challenge is to break the social exclusion walls and welcome older adults and chronic patients back to the society, introducing the "Participate 4" co-creation research and life-long learning programme. |

### 6.1.3. Phase 3: Envision alternatives

- Process and methodology

As co-creation is not always a linear process, the THESS-AHALL team took the advantage of some of the key activities conducted during the Reframe Phase and the respective collected data, engaging specific stakeholders to co-produce the proposed plan of co-creation activities for older adults and chronic patients during the prototyping period. Healthcare experts, who provided their insights for the reframing of the challenge, as well as primary stakeholders' views on their involvement in research, their likes/dislikes, needs and desires, stemming from both questionnaires and the field visit of phase 1 and the focus groups discussions of phase 2 were taken into account by researchers of the Living Lab, who tried to answer in the "what is in for me?" question by provided a comprehensive programme of participatory research activities in order to increase social inclusion of vulnerable populations.

A database of potential inclusive activities in cooperation with an open and accessible research community was set up, based on the exploitation of the "principles to opportunities", "value hypothesis" and "concept scenarios" design tools.

- Main outputs and results

Please, check the *reframing_infographic3* present in the Annex p. 34 for an overview of the main outputs of this phase.

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 41 THESS-AHALL ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Loyalty point system tool<br><br>(the tool was finally rejected, as it did not fit in SISCODE's primary objectives and it was recommended to follow a more primary stakeholder-centered approach: What is in the challenge for the primary stakeholders from their participation in research (not how they could help other peers). | Researchers (to monitor engagement), primary stakeholders to donate their participation in lab's activities for a pre-defined social good purpose, engagement of the market for private sponsoring of the social, participatory campaigns | Architectural (based on existed technology - loyalty point systems & gamification, but for new markets (for and with those who are benefitted) | High level of originality, as donation was based in the mutual involvement of both beneficiaries and the people donating their time.<br>Tested in preliminary short-scale pilots, it gave positive insights for engaging both citizens, vulnerable groups and policymakers in joint co-creation activities for donation | Lower coherence in terms of SISCODE's co-creation context<br><br>Feasible, but not in the short-scale experimentation of a European project (more complex) |
| An inclusive programme of research activities to fight the risk of social isolation of special target groups.<br><br>(The idea has been adopted since previous experience and primary stakeholders' views have shown that participatory research is an opportunity for social engagement and active citizenship, that could possibly tackle the loneliness, exclusion and ageism of specific target groups) | Older adults and chronic patients, who will have the opportunity to get actively involved and socially included as strong collaborators in a different kind of social activities, participating in co-creative research.<br>The Academia and the research community, which would realize the real value of engaging citizens in their research, making their field of action more friendly to the society, more accessible to citizens. | Incremental (the most common type of innovation, where existing know-how, e.g. participatory research, makes/increase value for end-users, e.g. increase the social inclusion and active citizenship of specific, sensitive target groups. | High level of coherence within the SISCODE project's experimentation journeys.<br>High engagement for both primary stakeholders and the Academia, since there is value for all sides, who collaborate in order to find common solutions for societal and everyday life challenges. To this end, the policymakers should also realise the value of such a collaboration for the society as a whole.<br>High level of feasibility at the local and the European levels, as a positive case study for other societies and the research community on how to include sensitive citizens in research, making value for them and the society (if the challenge succeeds)<br>Positive assessment in terms of effective "shared value" distribution. The citizens' science and co-creation could become a new means of tackling social exclusion phenomena, like ageism and chronic diseases' cultural stigma. Active citizenship and the democratization of research in the forefront of the society and for the benefit of sensitive populations. (Research not just for research but for the society). | Lower in originality, but a solid ground for experimenting with special target groups, like older adults and chronic patients. |

## 6.2. Solution: the selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| *Partners of Experience* |

# What?

**Description : t**he proposed solution is a coherent and complete participatory research programme for older adults and chronic patients, with the support of the THESS-AHALL and the Aristotle University of Thessaloniki, though which primary stakeholders will fight the risk of ageism and the cultural stigma, experienced due to their natural ageing or health related issues. The idea behind the solution derives from the many-year close collaboration of the Lab researchers with a wide network of stakeholders in co-creation activities and research piloting, as well as from the positive experience of older adults and patients' participation in Lab's activities, as "partners of experience" and not as temporarily assistants of subjects in research. As they call themselves as "ambassadors" and "partners of life" of Living Lab, the proposed solution aspires to set these target groups in the centre of the research activities for a whole academic year, as other "researchers", equal to Lab's staff. Being in the "shoes" of researchers, older adults and chronic patients will become "Partners/Researchers of Experience" in real-life context/activities.

Some of the potential co-creation research activities could be:

- Design Thinking and co-creation sessions in the frames of Lab's research projects (facilitating some sessions and doing co-creation research to develop technologies or user interfaces, friendly to their peers)
- Lectures to medicine students (personal experience on a health or well-being issues), like academic teachers, *e.g. about how they experience their disease, or the disease of a relative (e.g. dementia carers)*
- Visits to university structures (e.g. media lab +co-creation activity, seismology- how to be ready for an earthquake, make museums accessible) to exchange knowledge and experiences with other researchers and contribute to their research efforts
- Do some "desk research" on an issue of their interest that also suits to Lab's activities (e.g. healthy eating, technology, stress management etc.), prepare some informative material with our assistance and organise an informative open event in the university or in the city centre to inform other citizens/peers
- Assign some semester projects on topics of their interests to students and guide them, with our contribution, to complete the job
- Participate in open academic events, local conferences or exhibitions in the university, along with researchers of the Lab.
- Contributing to the production of an academic research paper

This solution is a kind of a service, a number of participatory initiatives within the academic context, but for the benefit of stakeholders and their social inclusion, as active citizens again. It differs from the initial idea of the "Participate 4" campaigns, as it focused on the value for the primary stakeholders, the older adults and chronic patients involved in the co-creation research and not in the potential value for other peers or people in-need, through the donation of time.

**Type of prototypes:** *services*

# Why?

The main societal need addressed is the fighting of the potential loneliness and ageism, experienced by the ageing population and chronic patients, mainly due to retirement and the loss of their mental and physical competencies.

**Direct values:** the social inclusion and active citizenship of sensitive population groups / the importance of welcoming back to the society marginalized patients

**Indirect values:** the "human" centred/ democratized research (co-creation, Open Academia) and its benefit for the society and citizens/ the value of citizens' active participation in research for the Academia ("From Science in Society to Society in Science") physical abilities

**Influence on policy:** the Academia (the University, the research community etc.) to realise the value and the need for involving citizens in its activities, adopting a democratized and user-centred approach / policymakers (including politicians, civil servants, NGOs) to embrace the scientific community and side for its "openness", to learn more about co-creation as a tool for addressing societal challenges, and as a result to provide support co-creation and responsible research, recognising the high impact of research for the society and the everyday life.

# How?

**Activities:** Starting from mid-September 2019, all the different types of the involved stakeholders will be gathered in a preliminary co-validation session, in order to assess and accept/pivot the activities' programme (expressing final views, doubts and additional suggestions): **Creation of a plan (+co-setting some KPIs for the final evaluation)**

Conduction of the activities' programme, running/testing all the different activities within a year and evaluating each one of them along with the involved stakeholders: **Developing the prototype**

Final assessment of the entire programme with the help of stakeholders (lessons learnt, feedback & reflections, pains & gains): **Evaluating the challenge**

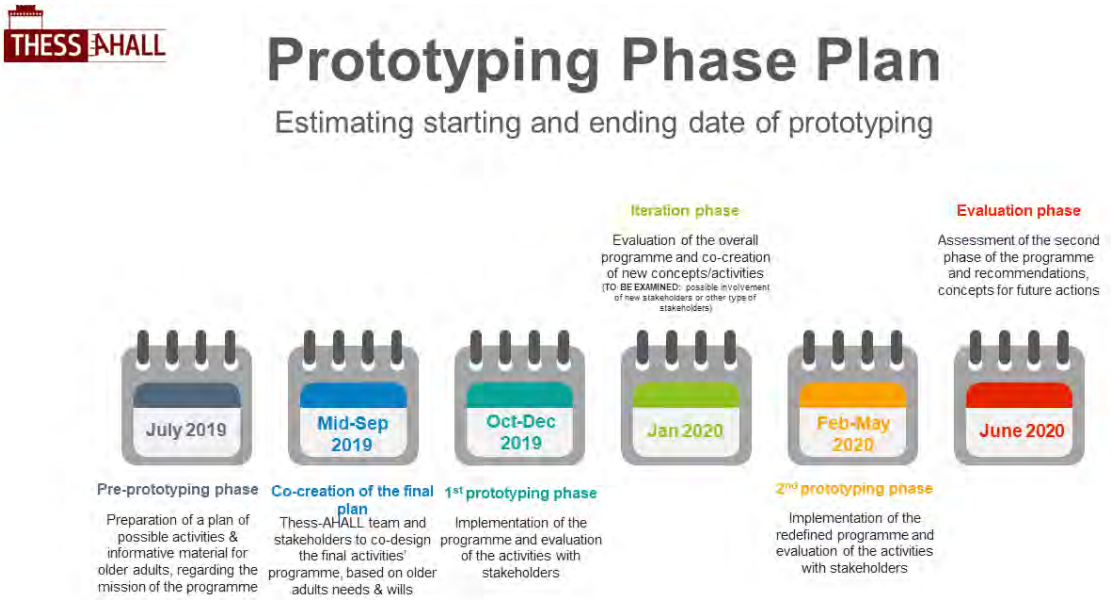
Decide if pivoting is needed, improvement of the activities: **Iteration**

**Main stakeholders and responsibilities: Main target group:** Citizens (older adults & chronic patients), patients associations. **Main stakeholders:** the Academia (scientists & researchers), experts (from the healthcare sector), policymakers (local authorities at the municipal and regional level, responsible for the promotion of RRI in the city), the Civil Society (organisations and NGOs, as supporters of the challenge)

**Budget:** 10-12.000€, average of 1.200€/activity => TOTAL no. of 10-12 activities within the prototyping period. The budget meets the DoA description for the prototyping costs and concerns physical materials, printouts, stationary for the co-design events, cost for exhibitions and the open events, the participation in local conferences, visits to museums and co-organisation of workshops in other university structures, development of a technological solution (this is only an estimation, since the final budget will be determined after the determination of the final activity programme).

**Data collection.** THESS-AHALL aspires to measure the satisfaction/motivation of participation for the specified target groups and any changes in their feeling of social inclusion. Also, the Lab is interested in the assessment of the different types of participatory activities and Academia's evaluation of the activities and their value for citizens. The data could be collected by questionnaires (from activity to activity), focus group discussions and in-person interviews with all the involved parts of the challenge.

# When?




# Comments

THESS-AHALL's main pain at the moment is to ensure the active involvement of policymakers. So far, it was difficult to approach local policymakers, due to the successive triple elections, conducted in Greece, although there are some early in-person discussions with the Region of Central Macedonia for collaboration. September will be a milestone for engaging policymakers to the challenge. The project coordinator is informed about this development and agrees for their later involvement in the challenge, understanding the difficulties and supporting that as the challenge is not linear, they can join the activities in a later step.

*Please see Annex II p35-36 for the complete description of the idea canvas and the Experimentation Canvases.*

## 6.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

The high-level policymakers in Greece, the government and the national healthcare system authorities, lack information and specific policies for older adults and chronic patients, in terms of ageism and the cultural stigma. Their initiatives often include some fragmented efforts for social awareness campaigns in the framework of some international days for diseases or older adults, using old-fashioned communication channels, leaflets and TV spots. Moreover, policymakers are not well-informed about the latest developments in research and the do not take the fully advantage of the value of communicating research outcomes to the public. Although, during the recent years, the latest governments have invested in the operation of new research centres and the funding of doctoral and post-doctoral researchers, the local policy context has poor knowledge of co-creation and it does not promote the democratization of research and participants' involvement in it. Furthermore, in front of every new idea and innovative solution or method, policymakers demand tangible evidence, and usually translate the benefit into financial gain or votes, before they fund the research or support the implementation of its results in society. Also, the heavy bureaucracy in the public often makes policymakers inaccessible to both scientists and citizens. The access to public data remains quite limited, while, bureaucracy is a deterrent to access older adults and chronic patients in Greece, since researchers should apply and wait for a long time for receiving special permission to visit day care centres, hospitals, associations etc., and work with the stakeholders. The market/private policymakers usually ask researchers for evidence to prove that something works: metrics (researchers have to describe/ find the value the private companies).

Meanwhile, the Academia is still a quite close community, which does not always provide enough feedback on its activities and does not engage citizens in a systematic way. As a result, end-users accidentally participate in research activities, often feel of being "used" and they cannot understand what the value is they get from their involvement with research activities. Consequently, they become unwilling to continue their collaboration with scientists. On the contrary, there are several examples of successful policymaking, concerning older adults and chronic patients, like the activities provided by the municipal day care centres and the good practices met in nursing homes and rehabilitation centres, of which researchers can take the advantage and improve their knowledge and experience in working with these stakeholders' groups.

- Engagement with policy makers

Although the involvement of local political authorities was not as active in the challenge so far as it was expected, due to the successive elections (local, European and now early national elections) in Greece, and the respective pre-election periods that has been started since the first steps of Phase 1, THESS-AHALL has already taken the advantage of some existing policies on older adults, chronic patients and social research in previous activities, examining the potential incorporation of some of them in its challenge (like the Greek Inter-Municipal Network of Healthy Cities (promotes good practices in public health and well-being).

The THESS-AHALL has also made a contact with the Head of the Directorate of Innovation & Entrepreneurship Support of the Region of Central Macedonia, which is very active in RRI and has the experience of participatory research and Smart Specialisation (S3). The aim is the Region of Central Macedonia to support joint activities with the Aristotle University of Thessaloniki and the community of primary stakeholders of the Living Lab, promoting and embracing co-creation and its value for the society and the Quality of Life of specific populations, like older adults and chronic patients. A strong collaboration of the Academia and the local authorities, like the initiative of the Municipality of

Thessaloniki and the University for open lectures and courses to citizens, could strengthen the social inclusion and active citizenship of sensitive populations, welcoming them back to the public life.

The feedback from the Region of Central Macedonia and the Aristotle University of Thessaloniki was positive until now, but further and more detailed communications will be conducted at the beginning of September 2019, when the newly elected authorities will undertake their duties and plan their activities for the coming period, as well as when the new academic year stars.

- About the policy gaps and suggestions

*Table 42 THESS-AHALL: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Lack of awareness of older adults, chronic patients' needs (ageism, cultural stigma) | Policymakers should focus more on the needs of all the different types of stakeholders, and not to contribute to an even unintentionally marginalization of its citizens. |
| Need to strengthen the bonds between the Academia and policymakers | More joint actions, initiatives, often communication, seeking of opportunities for cooperation for the benefit of the society. Adoption of a democratized research, where the society has the main role. |
| The research community remains "close" to the public | Decrease of the communication gap and dissemination of research outcomes and developments in a simple language. The universities to become "open" to citizens and everyone who want to be informed or seek for involvement opportunities. |
| The heavy bureaucracy remains a deterrent for often collaboration between citizens/researchers and the local policymakers | The Greek policymakers to take the advantage of EU policies on participatory and open government, embracing both citizens and the research community, as collaborators |
| Limited policies for tackling the social isolation from both political authorities and the Academia | More efforts and higher expertise on social isolation, stronger cooperation between the policymakers and the Academia, since social exclusion and loneliness have been set as main priorities in the EU context, regarding health and well-being. |
| Limited knowledge of participatory research and its value for the society/citizens | The research community should find and follow positive examples of participatory research from the local and the EU context, as well as to invest in its researchers training on co-creation, its main principles and tools. |
| Not a systematic engagement of citizens in research (more as subjects and not as partners) | Researchers should understand the value and the high impact of citizens' involvement in their research and introduce an alternative approach of their engagement, promoting equal collaboration, among all the involved parts and to eliminate the previous decades belief of the "us-them" discrimination of the scientific community and end-users. |

- Future actions and suggestions for WP4 workshops

The THESS-AHALL life-long learning activities' programme will primarily be experimented at the local level of the City of Thessaloniki and with the support of the Aristotle University of Thessaloniki. At a second phase, there would be implemented some participatory research activities for older adults and chronic patients with the active involvement of the Greek Inter-Municipal Network of Healthy Cities and other research and educational bodies, which have close collaboration bonds with the Living Lab in order to test and evaluate the prototype of the challenge and its impact on vulnerable groups' social inclusion (short-scale piloting at the national level).

Also, similar to the national scale pilots could be co-organised and co-validated in cooperation with stakeholders (older adults and chronic patients) in European Living Labs (within or externally of the SISCODE consortium) and educational organizations outside Greece to test and evaluate the approach of participatory research activities in different cultural and policy contexts. Labs or entities interested in other kind of citizens marginalization, like ex-prisoners, refugees, homosexuals, uneducated people etc., target groups that are beyond THESS-AHALL's research interest, could try to implement the prototype (adjusted to their stakeholders' needs, in order to monitor and evaluate its potential impact on social inclusion.

In the framework of the WP4 national/international workshop, the THESS-AHALL would like to investigate if its challenge makes value for different policymakers and experienced experts as an alternative solution for limiting (if not tackling) the social marginalization of specific target groups.

## 6.4. Monitoring of the process

- Synthesis of the activities

*Table 43 THESS-AHALL : Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | Desk Research<br><br>Field Research & Interviews<br><br>Synthesize & Analyse data | Keyword bibliometric<br>Popular media scan matrix<br>Field visits (observation)<br>Research planning surveys<br>Interviews/ Questionnaires<br>Interest group discussions<br>Tools for infographics (Piktochart) | Poor quantitative data<br>-valuable data and some indicators on the social isolation and the cultural stigma in the EU[4]<br>-quantitative data on Lab's community satisfaction for their participation in co-research<br>Mainly qualitative data for initiatives to tackle ageism, the cultural stigma, as well as for the openness of the academia, interviews with experts on well-being and healthcare | >67<br>over 60 older adults<br>2 patients associations<br>5<br>researchers | Less tools than the proposed in the 3.1, but effective mapping of the field research, collecting both quantitative and empirical data to support the challenge.<br>Difficulties in finding much quantitative data and metrics.<br>Detailed interviews and focus groups with various stakeholders were conducted in order to balance the situation.<br>A database of qualitative and quantitative data, as a base for supporting the state-of-the-art of the challenge. |

| | | | | | |
|---|---|---|---|---|---|
| **Phase 2** | Interpretation of the data collected<br><br>Communicate the results to specific stakeholders<br><br>Search for new/frame opportunities | Infographics/presentations<br>Interest group discussions/ interviews with experts from the healthcare sector<br>Unstructured interviews with beneficiaries (primary stakeholders) or their relatives<br>Discussions with the SISCODE partners, experts in RRI and co-creation (either in the Milan workshop or in telco with POLIMI and DDC)<br>Ideation sessions:<br>Short-scale piloting with end-users to monitor the pains & gains | Communication of the main findings and interpretation in the context of THESS-AHALL's challenge, along with experienced professionals, caregivers and researchers, so as find which data of the desk research is applicable to fight social exclusion through participatory research.<br>Valuable information to pivot the initial idea of the "Participate 4" campaigns and crucial doubts and raised questions for the evolution of the challenge. | > 60<br>5 relatives/ caregivers<br>5psychologists<br>2 social workers<br>4 doctors<br>2 physiotherapists<br>3 researchers of the Lab<br>2Organisations (university museums, active in co-creation)<br>1 private company<br>40Chronic patients (persons with Autism) | As the challenge is non-linear, some of the activities of the Phase 1 found solid ground also in Phase 2, contributing to the final reframing of the challenge.<br>Policymakers were not so active in the challenge so far (due to the political elections in Greece). So the completion of all users' journey map is still ongoing. |
| **Phase 3** | Generate Ideas<br><br>Refine & Select Ideas<br><br>Generate a new concept | Value hypothesis<br>Principles to Opportunities<br>Concept scenarios | Database of new ideas/suggestions of participatory research with the active involvement of older adults and chronic patients<br>Creation of a structured plan of activities to be discussed with stakeholders, based on what the primary beneficiaries ask<br>Real-life and well-grounded number of co-creation activities for older adults and chronic patients | >25<br><br>10 older adults<br><br>5Psychologists<br><br>2 social workers<br>2Policymakers from the Academia<br>6researchers of the Lab | As the challenge is non-linear and it has recently been reframed, the phase 3 is a non-linear step, which is still ongoing and it is about to be completed just before the beginning of prototype, having the final assessment of the activities by all stakeholders and especially by the primary beneficiaries (older adults and chronic patients) |

The official establishment of the "Collaboration and Research Community for the Independent Living", comprised mainly of older adults and chronic patients, as well as by researchers & academics and healthcare professionals, has brought many different stakeholders' groups together to interact, collaborate and work on co-creation research activities, to exchange views, experience and knowledge and finally, to co-build the solutions they need to tackle everyday common problems.

Patient associations should be more engaged in the research activities during prototyping, as their role was limited mainly to consultation. Also, policymakers' involvement will be more direct and active, starting from September 2019, since they did not have the opportunity to be engaged due to the successive elections in Greece. After the reframing of the challenge the participation of private bodies

as possible sponsors has been changed. The role of the private sector, as integral part of the society is still under revision, examining the involvement of private organizations, as potential supporters/proponents of the Open Academia and citizens' science for the benefit of the society.

*Table 44 THESS-AHALL Stakeholder engagement table*

| **Effective Stakeholder group** | | **Level of engagement** | | | | **Comments on the effective participation and relevance** (any changes from D3.1, why?) |
|---|---|---|---|---|---|---|
| | | **Co-Producing** | **Co-Designing** | **Consulted** | **Informed** | |
| Citizens | Older Adults | ☒ | ☒ | ☒ | ☒ | They are the primary stakeholders of the challenge, the main beneficiaries. People who are at risk of ageism and experience social exclusion due to health problems and ageing.<br><br>Their active involvement in every stage of the challenge is crucial: their likes/dislikes, to design and re-design the challenge's activities, to engage other people, to spread the message of co-creation and RRI, to share their knowledge and experience and if their participation in research helped them to feel socially included and active citizens. |
| | Chronic Patients | ☐ | ☒ | ☒ | ☒ | |
| Experts | Caregivers | ☐ | ☐ | ☒ | ☒ | Not as much co-production and co-design role in the challenge, as consulting and informing about the core ideas and the reframing of activities and the initial goals of the challenge. Their involvement and experience is very important to recognize the needs and the problems of the primary stakeholders in order to motivate their participation in activities valuable for them. |
| | Healthcare providers | ☐ | ☐ | ☒ | ☒ | |
| | Doctors/ Psychologists | ☐ | ☐ | ☒ | ☒ | |
| | Social workers | ☐ | ☐ | ☒ | ☒ | |
| Civil Society/NGOs | Nursing homes | ☐ | ☐ | ☒ | ☒ | Their experience is significant to map the social isolation and the cultural stigma phenomena, experienced by chronic patients, as well as the kind of inclusive activities they would possibly like to participate. |
| | Patient associations | ☒ | ☒ | ☒ | ☒ | One of the most important target groups of the challenge, since they can provide valuable data for chronic patients' needs, how they experience the cultural stigma, while also they can be the core stakeholders of the challenge, co-designing and co-producing solutions as alternative scientists, through their participation in co-creation activities. |
| | Directors from associations/ institutions | ☐ | ☐ | ☒ | ☒ | Their experience is significant to map the social isolation and the cultural stigma phenomena, experienced by chronic patients, as well as the kind of inclusive activities they would possibly like to participate. |

| | | | | | | |
|---|---|---|---|---|---|---|
| Policy Makers | Representatives from municipalities/ regional authorities | ☒ | ☒ | ☒ | ☒ | Direct policymaking: active participation in joint activities along with the primary stakeholders and the research community, to promote the principles of co-creation as a means of social inclusion and to spread the word of "open science" and its benefits for the society, recognizing the high impact that research has for citizens and the public life. |
| | Regional Health Authorities / Greek Inter-Municipal Network of Healthy Cities | ☒ | ☒ | ☒ | ☒ | Direct policymaking: active participation in joint activities along with the primary stakeholders and the research community, to promote the principles of co-creation as a means of social inclusion and to spread the word of "open science" and its benefits for the society, recognizing the high impact that research has for citizens and the public life.<br><br>Also, their experience in working for the public health sector could help to identify the social isolation and ageism, experienced by specific populations. |
| | The Academia (university) | ☒ | ☒ | ☒ | ☒ | Indirect policymaking: to support co-creation in real-life contexts, to set the citizens in the centre of research and help the challenge to find its pathways to cultivate active citizenship by opening its "doors" to the society and co-designing, co-implementing inclusive activities. |
| Scientific and research community | Researchers<br><br>Research Centers | ☒ | ☒ | ☒ | ☒ | The research community will be the closest collaborator of the primary stakeholders, motivating their active participation in every step of the research activities. Also, they should act like the "voice" of the University in order to promote its openness and to motivate more and more researchers to embrace user-centred and co-creation methodologies. |

# Ciência Viva

## Exploring

Limited public access to river; connotation of elitism; fear; Culture of contemplation vs. immersion in the river

## 7. Ciência Viva journey

Marine leisure activities are relatively uncommon in Portugal – and in the city of Lisbon – compared to other activities and other countries and cities with similar geographies, or less favourable conditions. Marine sports and activities for recreation, fun, instruction, tourism, etc. are crucial to increase ocean literacy, i.e. the awareness of the mutual influence of the ocean and human health and well-being. But to have any meaningful impact, in terms of ocean awareness and protection of ocean's health, marine leisure activities must be widely practiced. Ciência Viva's wanted to address this gap, how to get more people into the sea. Resulting from the co-creation journey, the co-lab set itself the specific challenge of devising interesting, mobilizing, safe and accessible experiences *in* the river in this part of the city. The solution that the co-lab proposes is an annual workshop for construction of usable rafts, canoes, small boats, etc., to be tried and shown in a multidisciplinary in situ (i.e., by/in the river) festival devoted to the river/sea.

## 7.1. Ciência Viva's journey implementation

### 7.1.1. Phase 1: Analyzing the context

- Process and methodology

Desk research was based on the considerable body of research and "grey" literature available on the web focused on recreational boating and water based sports in Portugal and in the Lisbon area. This include statistics, reports, dissertations, papers, etc. mainly from researchers in geography and urban planning; tourism; economy and innovation; cultural heritage; and sports. In the field, we interviewed key stakeholders identified in the literature or through snowballing/recommendations from other interviewees (~15 people); we had informal conversations within the personal and professional networks of the team, or with random people familiar with the river/sea in the Lisbon area, in Portugal and elsewhere. Some of the interviews served for "recruitment" for our co-lab. Field research included the observation and documentation of the "design" of the river and of its real uses, in Lisbon and in the neighbourhood, with photos, short videos and field notes. We also observed and/or took part in activities to address problems pertinent to our challenge (e.g., assessing the physical conditions of a dock near Pavilion of Knowledge; a parade in the river to show the results of a City programme to engage school children in water sports; a Catholic procession by boat, focused on the importance of the river heritage). Desk and field research materials were organized with basic qualitative coding techniques, looking for themes and trends, mapping stakeholders, comparing and merging different SWOT analysis

- Main outputs and results

One of the co-lab stakeholders suggested that the context of leisure water based activities in Portugal is best illustrated by a fish that bites its own tail, i.e., a vicious circle. (*See Annex II p. 38*)

Most maritime activities in Portugal are connoted with risk and/or elitism, seen as things for which one needs special and expensive equipment (sports for rich people), or otherwise risk one's lives (the fate of professional fishermen or careless beach goers). These associations are considered persistent forces keeping users away from leisure activities in the water. In the geographical area of Ciência Viva's challenge – a large part of the river Tejo outside commercial or industrial water routes –, the lack of leisure activities means that there are no economic incentives to develop or keep the navigability of the river, hence the lack of care of existing infrastructure and of the river itself (e.g., dredging the bottom of the river). Public access to the river for recreational purposes is inexistent in most of the city; and the only public ramp in Lisbon, built in the neighbourhood, is unusable in practice, for lack of maintenance. The few infrastructure and equipment that allows for paid individual access to the river are located far from where most people live, discouraging even more people from using the river. In more general terms, this translates into a "culture of contemplation", in which the river (and the few activities taking place there) is to be observed from land, but not for use or… immersion.

*Table 45 Synthesis of Ciência Viva*

| | |
|---|---|
| Theme | Limited public access to river; connotation of elitism; fear; culture of contemplation vs. immersion in the river |
| Needs | Fostering activities (sports, leisure, informal, etc.) in aquatic environments, for health, cognitive devolvement, environmental awareness, citizenship engagement. Create a public to create demand *and* to raise issues related with conditions of the river (access to water, cleaning of the river, etc.) |
| Key evidences | Official statistical data shows how sea sports/activities are not very popular in Portugal (compared to most European maritime contexts); Eurobarometer data shows how the practice of sports and informal physical activity in Portugal is very infrequent; and provides some insights about motives for this – e.g., lack of time; lack of motivation; cost[4] .<br>Ethnographic observation and interviews made by the team, and documents produced by some of the co-lab stakeholders show how the river in Lisbon is *not* used, and in particular how this state of affairs is created by explicit decisions about infrastructure made by authorities that render the river inaccessible to the public, or to leave large sections of the river and access to it unkempt (see Annex II – p38).<br>Decades of reports and strategic plans made by the Portuguese government, academia and businesses measured and evaluated concrete needs/opportunities/barriers for the development recreational activities in the sea.<br>Recent successful national and local initiatives to promote water activities for young people show that there is a demand for such activities, and that sometimes all it takes is simple logistic arrangements and a relatively small investment. In Lisbon, Clubes do Mar, a programme of the Municipality in association with nautical clubs offering free sailing/kayak classes for school children started in 2015 with 114 voluntary participants; in 2018 the number soared to 779 (universe = ~25 000). |
| Main policy context elements | The idea of fostering a "marine culture" is a widely shared ambition that permeates policy agendas at national, city and even neighbourhood level, with stated goals of getting more people in the sea, as a way of developing the tourism market; of increasing sports practice and health; raising environment awareness, or "ocean literacy", etc. In theory at least our project fits this background, and interviews with policy makers seem to confirm this.<br>Adding to this, Ciência Viva's pilot landed right in the middle of ongoing negotiations over the management of the city water front. Access to the river is historically ruled by the Port Authority (a publicly owned limited company); but new regulation is coming into force that transfers some of the ruling power to the Municipality, or even the neighbourhood.<br>In interviews, local policymakers, as well as other key stakeholders, considered these changes an important opportunity for our pilot; on occasions, they explicitly mentioned Ciência Viva as an ally that could help mobilize the public and create interest for maritime activities in the river, and perhaps put some pressure on the national authorities to speed up the transfer of "power". |

[4] https://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/ResultDoc/download/DocumentKy/82432

### 7.1.2. Phase 2: Reframing the problem

- Process and methodology

Desk and field research started by untangling the nature of the problem underlying the initial Ciência Viva's challenge ("How to get more people in the water?"); we interrogated prospective stakeholders and the literature to get a sense of how are people ***not*** using the river/sea, to understand what was this problem. Ideas and themes that emerged in this phase (analysed as described in 1.) revealed two major dimensions of the problem: limited physical access to water; and a vaguer "cultural" resistance to water based activities.

We then used two main tools to synthesize, categorize and refine this information: 1) a provisional SWOT analysis of leisure water activities in Portugal, and later in Lisbon and in the neighbourhood, that helped looking at the dimensions of the problem that the co-lab should and could address in any meaningful way, 2) a stakeholder mapping, with a clearer idea of the interests, needs, skills and relationships between current and potential stakeholders. In short, this helped reframing the initial challenge to make it more concrete and workable.

- Main outputs and results

The synthesis tools mentioned above (SWOT, stakeholder map) and the "Checking your challenge" template guided a workshop with four core stakeholders and two internal team members to reframe the initial challenge. The challenge that resulted from this meeting was: "How can we show that the river in this part of the city is interesting, accessible, safe – but that it need attention from authorities for its fruition".

In preparation for an idea generation workshop, the internal team further refined this challenge, which was presented to the participants for a quick evaluation taking into account two of the "Checking your challenge" dimensions (daringness, feasibility). The challenge that eventually guided the idea generation was: "What interesting, mobilizing, safe and accessible experiences could our co-lab create in the river in this part of the city?"


*Figure 8: Ciência Viva MindMap – Phase 2*

*Table 46 Ciência Viva key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| Representative of Association of the Parque das Nações | An advocate for leisure boating; plans and develops mobilization activities in the river; lobbies for improving access to water | Sees this as major event that can frame their plans for "political" river parades, i.e., tours as statements asking for improving access to the river, and development of the "water way" |
| Representatives of Resident and business association of Parque das Nações | Identify and report opportunities and issues for citizens and businesses in the neighbourhood of Parque da Nações. Help organizing activities in the neighbourhood and mobilizing individuals, families, businesses and local authorities. | Interested in popular initiatives in the neighbourhood drawing attention to local potentials and barriers |
| Municipality + Neighboorhood | Experts in the regulatory framing and strategic planning of activities related with our pilot; organizing activities relevant to our pilot (e.g., municipal school programme for water sports) | Fits their plans of attracting people to the river, rebranding Lisbon/neighbourhood as water friendly places; fits major incoming initiatives taking place in the city/neighbourhood, 2020-2022 (Capital of Sports; Green Capital; urban/water front regeneration for visit of the Pope/Youth Festival) |
| President of Marina (also researcher in leisure boating and related fields) | Planning, developing and supporting leisure activities in the river.<br>As researcher in this field: identifying and mapping issues at stake in water leisure activities in Portugal/Lisbon | Help establishing the Marina as "manager" of water front/water activities in this part of the city; attracting more people to water sports; interesting the public in "maritime culture" in general |
| Maritime scouts; local school; Sea woman association | Developing, organizing and participating in recreational boating activities in the river (for young people and older women respectively); raising awareness about the environment, human and ocean health. | See the pilot as new, interesting challenge for development their activities |

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 47 Ciência Viva Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | What service, equipment or practice could help engaging the public in marine leisure activities, while promoting ocean literacy and awareness, and being accessible to a wide range of users? |
| Synthetic formulation of the reframed challenge. | What interesting, mobilizing, safe and accessible experiences could our co-lab create in the river in this part of the city? |

### 7.1.3. Phase 3: Envision alternatives

- Process and methodology

Virtually all stakeholders "generated" ideas while engaging with the team from the very start of the project, either by telling what we should work on, or offering insights that made us think of solutions, inspiring internal discussions that lead to other ideas; some of these ideas would later resurface during more formal ideas generation sessions.

The team organized two workshops for idea/solution generation: the first one was initially focused on reframing the problem, with core stakeholders; idea generation was a kind of by-product of problem reframing. The second workshop, explicitly for idea generation, involved a larger group of stakeholders. 13 participants were invited to write ideas on cards answering the question: "what **interesting, mobilizing, safe and accessible** experiences could our co-lab [with such and such skills, interests, considering such and such local opportunities/weaknesses, etc.] create in the river in this part of the city?"

Solution cards were framed in a matrix with quadrants representing our challenge (access to sea/river; mobilization; safety; interest); the ideas were discussed and categorized collectively. A trend started to emerge, most ideas being placed in the "interest" and/or "mobilization" quadrants. There was no voting, rather a consensus was reached on what group of ideas offered more value, i.e., those that involved actual experience of the river.

Still, quadrants with less ideas were not ignored; the group considered accessibility as something that probably the co-lab can't address (because of costs, political and technical complexity), but it still emerged as an issue that mobilization of the public could help raise; and safety was seen as a dimension that must be taken into account whichever solution the co-lab chooses, even if not really working on implementation of safety measures. We interpreted this as an invitation to develop a solution that should address the need to make the river interesting, with different activities *in* the river capable of mobilizing diverse publics, using whatever infrastructure and equipment is available now, while at the same time drawing the attention of authorities for the improvement of this equipment and infrastructure.

- Main outputs and results

As presented in *Figure 9,* the matrix of the synthesized resulted illustrated what participants explicit during the workshop.

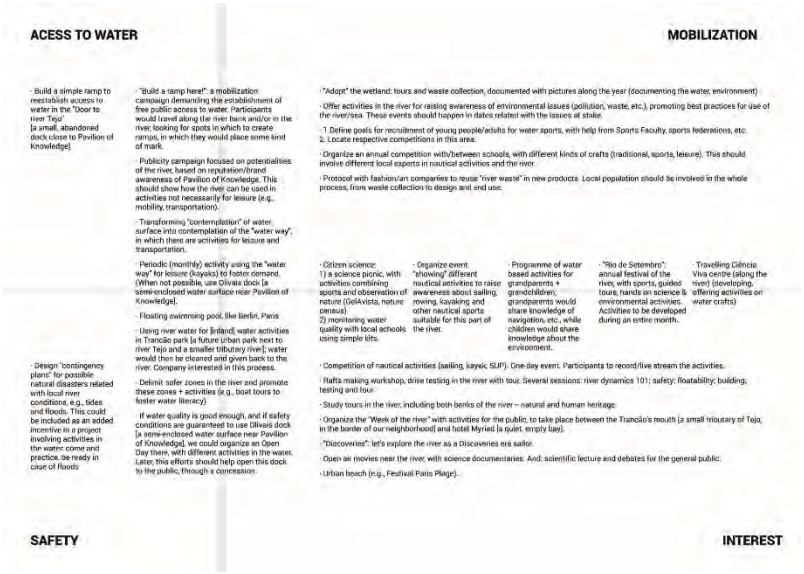



*Figure 9 Matrix of Safety / Interest / Mobilization, and Access to Water*

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 48 Ciência Viva Ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + | opportunities - |
|---|---|---|---|---|
| Create light, cheap ways for public access to water | Suggested across most stakeholder groups | Product (design of equipment, materials); policy (putting local government in charge of access to the river | Addresses a fundamental need related with the challenge. It could be the theme of a contest of ideas itself part of lobby campaign for improving/democratizing access to river. | "Working with water infrastructure is always messy" (to quote a co-lab stakeholder); not easily within the reach of project, even of CVIVA competences and means; being pursued by more powerful actors |
| Install equipment creating safe areas in the river for the public | Frequently suggested by potential "users" | Product & service (equipment and materials) | Persistent (if not huge) public demand for this kind of equipment. Similar equipment in other cities have strong popular support. | Not very original (it's a frequent proposal in Lisbon participatory budget; there are plans of the Municipality for this); can be expensive (pools); limited value and interest (only for physical activity, leisure) |
| Design and install equipment to support activities in the water (e.g.. lockers for water crafts, showers) These can be "smart", connected to apps for different purposes (payment, information, gamification). | A suggestion frequently made by actual and potential "users" and local advocates of water based activities | Product & service | Addresses a fundamental need related with the challenge. It could be the theme of a contest of ideas itself part of lobby campaign for improving/democratizing access to river. May be interesting for (local) businesses. | Doesn't work on its own, requires the two solutions mentioned above |
| Organize, promote group boat parades to show potentials of the river AND obstacles to its use | Advocates of the "water way" | Policy (event for creating/raising an issue) | Original as a "demonstration" (in the sea). It could be easy to mobilize a decent number of participants among current "users" of the river. Potentially pertinent considering current negotiations for management of water front | Major limitation: lack of visibility of activities inside the river limits its demonstration effect; if idea is to bring the public to the river, it can be counterproductive calling attention to negative aspects. Potentially divisive considering current negotiations for management of water front. Limited value/interest in itself |

| | | | | |
|---|---|---|---|---|
| Organize, promote exploration tours, by boat or along the river banks. Tours can be themed and/or gamified. | Researchers (e.g., working in citizen science, public awareness), science communicator, schools | Event | Original, interesting, especially if gamified | Organizing and supervising the event may be challenging |
| Organize water sports festival/competition to take place in this part of the river, especially for schools | Spontaneous suggestion by different stakeholders; users; local advocates of water based activities | Event | Easy to mobilize a decent number of participants among current "users" of the river. It can attract people to the river, spectators (as evidenced by events in other parts of the city). Attractive to businesses and to local policy makers | Limited value/interest (sports only); not original; already organized in other parts of the city; reproduces idea of the river/sea as spectacle to watch (not interact with); won't attract new, different users |
| Set up a regular science fair focused on the river/sea, include water based activities, entertainment | Users, local residents, researcher, science communicators | Event | CVIVA has previous experience in designing similar/related events; good contact's network to implement. Attractive to local policy makers. | In itself not very innovative, and probably not very interesting for business |
| Design a citizen science programme for issues related with the river; involve schools, families, public | Research community, science communicators, schools | Activity | Attractive to national policy makers (science, education ministries). Interesting and feasible, it could help mobilizing different stakeholders | Not very original (even if CS is not that much practiced in Portugal); limited reach (niche segments of the public; business probably excluded) |
| Raft/boat making workshop, with several sessions covering all the scientific and technical issues involved, ending with tour in the river | School communities, potential "users" and local advocates of water based activities, science communicators | Activity | Very interesting, rich content, covers different aspects of the challenge. Similar, simpler initiatives elsewhere in the country are popular. Stakeholders in the team with relevant expertise and/or contacts. | Actual implementation can be tricky in a big, sea-like river. Needs relatively large, multi-expert organization team. How will funding be guaranteed? |

## 7.2. The selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| **Build your own boat/Bring your own boat** [provisional] |

# What?

**Description :** Our solution includes an "anchor" activity with "satellite" events. The anchor activity is a yearlong workshop for construction of life-sized, usable watercrafts (rafts, canoes, small boats, etc.). The workshop will have successive modules comprising different subjects: the river, boat design, floatability, boat construction, basic navigation skills, safety, etc. Workshops can be thematic (e.g., boats using no plastic parts; boats using recycled plastics; open source boats; inspired by traditional river Tejo boats, etc.). Crafts constructed would be shown in an annual event to take place in one location (to be defined) in Parque das Nações, the neighbourhood of Pavilion of Knowledge. This would be a weekend event, with some sort of exhibition of the boats in the water (a contest? a race?). A multidisciplinary fair/festival devoted to the river/sea would take place in situ, offering a wide range of activities in the river: sports, citizen science projects, cleaning campaigns, tours, etc.

Our solution differentiates from two mainstream currents for engagement of people with water/rivers/sea: promoting water sports, usually for children, with training and occasionally with competitions; and ocean literacy/awareness campaigns, including those organized by Ciência Viva, usually based on the display of/engagement in scientific activities and products related with the ocean – but taking place in land, inside science centres, aquariums, etc. Our approach aims at immersion and interaction with water environments, and involves a wide range of people – not just children or sports people, but also the public, researchers, makers, artists, families, businesses – creating something that explores different uses of the river.

# Why?

The creation of a public is needed to break the vicious circle described in 1.1.1. The solution – even the prototyping alone – could help in this regard: it requires the mobilization of a wide range of stakeholders; it could raise interest in the river, and in the several dimensions of water leisure activities in general: scientific, sportive, playful, cultural; and calls attention to actual conditions of using the river (or lack of), but in a positive way.

# How?

**Activities:** Main stages of our prototyping are: management and planning – including research for preparation of the prototyping (e.g., DIY boat construction; revision of stakeholder mapping) and stakeholder engagement > Organizing boat construction workshops > Prototyping an immersive science festival in the neighbourhood/river. We are envisioning a small-scale prototype, i.e., a a few short/intensive watercraft construction workshops, with limited, but varied, stakeholder groups (school, scouts, makers).

**Main stakeholders and responsibilities**

**Budget:** PMs from CVIVA SISCODE team

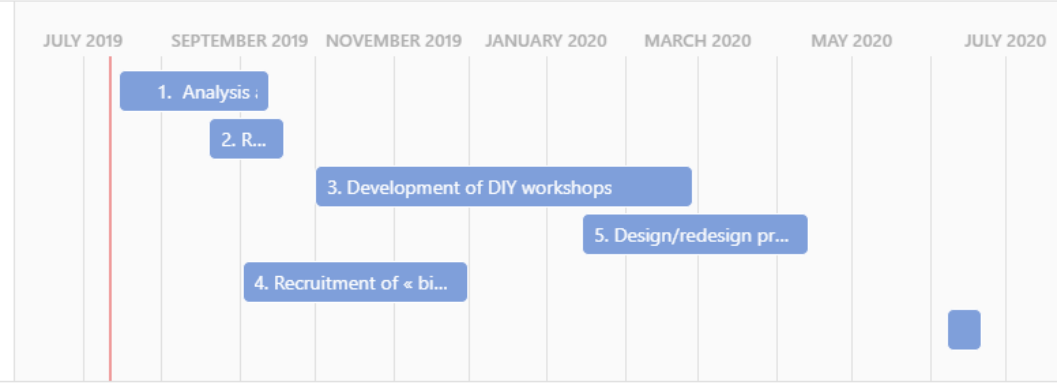
Workshops: templates for watercrafts (acquisition if not open source; <100€); materials for watercraft construction (<10k€); co-creation events, including of the development of the science fair in the river (<5k€)

**Data collection.** We will assess the feasibility of a DIY watercraft contest, how interesting will this be for "bigger" stakeholders (city policymakers, businesses, possible funders), and its capacity to engage the neighbourhood public. For this, we can use participant observation (focused on the workshops); qualitative interviews after workshops; and individual + group feedback sessions.

# When?

**Duration.** First meetings and contacts with new stakeholders should start in July. Final event should be in June 2020 – tentative date: during UN Ocean Conference, in Lisbon (for which Pavilion of Knowledge will host the so called "ocean village", a set of public engagement activities related with ocean literacy).

**Time scope:** 1. Analysis and planning with core stakeholders 2. Recruitment of school, scouts, makers 3. Development of DIY workshops 4. Recruitment of "bigger" stakeholders (policy makers, business, funders?) 5. Design/redesign prototypes of river science fair 6. Test DIY boats + mini-fair.




# Comments

First we need to have a better grasp of how to prototype an event/activity (as opposed to a more tangible product).

Then we still need to decide if we want to prototype the whole package of our solution – boat building workshop + satellite events – or if we should focus on one of the components only; for instance, would the boat building workshop work by itself; or, on the contrary, should it be just a possible component of a science festival by the river?

We also need to reconsider our current stakeholder mapping; in particular, we must evaluate the "political" challenge posed to our organization in involving particular stakeholders that are currently not in the co-lab (but that could be part of the solution).

Please see Annex II p39-40 for the complete description of the idea canvas and the Experimentation Canvases.

## 7.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

Co-creation ideas and initiatives are recent in Portuguese policy context, they tend to be focused on engagement of experts, and in general the participation of the public is limited to debates and/or consultations (see, in Portuguese, www.portugalparticipa.pt/Monitoring/). A more active participation of citizens in creation of solutions for local challenges (occasionally challenges related to CVIVA's pilot) is organized by the city participatory budget, in which individuals propose solutions

to be voted by the public and then approved or not by the Municipality; there's a similar initiative, but for neighbourhoods with special needs and involving local organizations; citizens, however, have no role in the actual design or development of approved solutions. The recent Forum for Integrated Governance (GovInt, http://www.forumgovernacaointegrada.pt) was created as an informal collaborative platform, with private and public organizations, including the Lisbon Municipality, for reflexion on national and local social problems; they organize workshops using co-creation tools (for instance, issue mapping and idea generation to fight noise pollution in the city); again, these workshops seem to involve only experts and as far as we know co-creation stops short of actual design of solutions. Another recent initiative, LabX is a laboratory of for service design hosted by the Portuguese government; they explicitly use design thinking approaches and claim to work with experts, users, service providers and managers to experiment new solutions to improve public services for citizens and businesses, but there are no detailed records of the activities.

Our specific local context seems to be no exception to this. Local policy makers claim the need to take citizens views into account, but there are no formalized procedures for involvement of the public in solutions for local problems, and there's not much citizen participation other than reaction/protest against local occasional problems (e.g., contaminated soil in this part of the city, physical conditions of sections of the water front). There are a few successful grassroots campaigns involving co-creation to some extent, even if not named as such. These campaigns address challenges in the neighbourhood (claiming the street for family use; taking kids to local schools by bike) and are sources of inspiration for our solutions – indeed, two of the designers and organizers of these campaigns are involved in the co-lab. Such ideas seem to be cherished by the neighbourhood government, but are not supported or incorporated in actual policy measures.

- Engagement with policy makers

We are connected with policy makers at two local levels, the Municipality and the neighbourhood governments (which are independently elected). Approaching them was straightforward, in part due to the history of collaboration and personal networks between local policy makers and the Pavilion of Knowledge. Initial engagement with policy makers was easy; they were open to meetings (in their offices) and expressed their interest in collaborating, gave insightful information, offered to help in activities like dissemination in the neighbourhood.

But it helped that our challenge fits the current agendas of different departments of the Municipality (e.g., mobility, sports, sea economy), as well as the neighbourhood's plans in for "giving back the river to the people of Lisbon". Local policy makers consider Ciência Viva a well-regarded influencer, and expressed their trust in it to help raising the public interest in these activities (and on occasions also to work as broker with the port authority, "ask"/lobby for facilitating and improving access to the river, etc.).

Getting them in workshops was somewhat more complicated – policy makers we invited didn't show up in any workshop, for instance. We do feel that they will be supportive once we show them a more definite plan, with concrete initiatives.

- About the policy gaps and suggestions

*Table 49 Ciência Viva: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Local policy gaps at the root of our problem, in particular, lack of public access to the river, poor conditions for using the river for "normal" people, can also hinder the execution of our solution | Mobilize those stakeholders that can guarantee good/safe *enough* access to the river (i.e., neighbourhood government, the marina administration, maritime scouts, local advocates and experienced users of the river) |

## 7.4. **Monitoring of the process**

- Synthesis of the activities

*Table 50 Ciência Viva Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | Analysing the context: 1.2 do research; 1.3 analyse data | Desk/internet research (media scanning, publications research); interviews and informal conversations, observation (pictures, videos)/participant observation | Quanti-qualitative data on national and local practices of water based activities; new contacts/stakeholders; provisional solutions | >35 | More extended than expected, we now see it as WIP that will continue throughout all phases |
| Phase 2 | Reframing the problem: 2.1 Visualise/interpret data; 2.2. reframe the problem; 2.3 frame opportunities | SWOT analysis/ opportunity mind map; problem definition canvas; idea card; "checking your challenge" template; generic narrative presentations (visualisation of quantitative data; field videos and photos) | More precise & workable problem; identification of more stakeholders to engage; identification of new routes of research. | 22 | |
| Phase 3 | 3.1 Generate ideas; 3.2 refine and select; 3.2 generate concept | Participatory SWOT analysis; generic ideation/ brain writing tool; idea card; adapted "Checking your challenge" template | Pool of solutions; combining parts of different ideas; rough concept | 22 | We were planning to have more formal ideation sessions, in particular with the local school community (and, although not initially planned, with the local maritime scouts group). Conflicts between agendas of Pavilion of Knowledge and of the schools/scouts prevented this. On the other hand, we came across solutions right from the beginning of the journey, both in desk and field research. |

*Table 51 Ciência Viva Stakeholder engagement table*

| Effective Stakeholder group | | Level of engagement | | | | Comments on the effective participation and relevance (any changes from D3.1, why?) |
|---|---|---|---|---|---|---|
| | | Co-Producing | Co-Designing | Consulted | Informed | |
| Local residents & "random" people | | | ☒ | ☒ | ☒ | Crucial for understanding how the river is "used" (or not used) in this part of the city. One resident, initially mapped as strategic stakeholder for his involvement in inspiring initiatives, left the pilot claiming "lack of expertise" – despite the good local insights and contacts he offered |
| Local associations | Resident and businesses association of Parque das Nações | | | ☒ | ☒ | Important because some of these people have been working in related/similar challenges > easy to form alliances |
| | Association of the Parque das Nações Marina | | ☒ | ☒ | ☒ | Important because some of these people have been working in related/similar challenges > easy to form alliances. Local expert in actual use of the river, including legal and safety aspects |
| Local school community | Colégio Pedro Arrupe (a "blue school") | | | ☒ | ☒ | Less involved than planned (because of time constraints) but are committed to participate, already planning to work on development of solution |
| Parish councils (elected bodies ruling neighbourhoods) | Parque das Nações | | | ☒ | ☒ | Easy to engage with (thanks to history of collaboration with Pavilion of Knowledge); challenge fits their agenda (fostering water activities; participation in the management of water front); will be crucial for development of the pilot |
| | Olivais (neighbourhood in the vicinity of Parque das Nações) | | | | ☒ | Failed to participate in reframing and ideation workshops due to last minute commitments; but actively interested in being engaged in the journey |
| Lisbon Municipality | Director of Sea task group (within the Economy and Innovation department) | | | ☒ | ☒ | Crucial partner, with long history of collaboration with CVIVA; easy to engage with, very knowledgeable of the sector. Failed to participate in reframing and ideation workshops due to last minute commitments; but interested in being engaged in the journey |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Staff of mobility department | | | ☒ | ☒ | Important to explore a possible dimension of our challenge – the river as a mobility solution (even if for now this seems discarded from our ideas). Easy to engage with, given their interest in alternatives to normal mobility solutions. |
| | Director and staff of Sports department | | | ☒ | ☒ | Easy to engage with, thanks to shared interest in fostering water based leisure activities. Will be crucial for development of solutions and engagement of current users of the river |
| Local businesses related with river activities | President of Marina Parque das Nações | | ☒ | ☒ | ☒ | Easy to engage with, thanks to shared interest in fostering water based leisure activities. Very knowledgeable of the river, as user, researcher and manager of the local marina. Failed to participate in ideation workshops due to last minute commitments; but interested in being engaged in the journey. Will be crucial for development of solutions. |
| Researchers | Working in maritime citizen science | | ☒ | ☒ | ☒ | Easy to engage with, thanks to shared interest in fostering water based activities, namely for citizen science projects and general awareness of the ocean sustainability, etc. Will be important for development of solutions.<br>For now, no need/occasion to involve other researchers (as previously planned). |
| NGOs in the field | Vela+/SeaWoman (engaging senior women in water sports) | | ☒ | ☒ | ☒ | Easy to engage with, thanks to shared interest in fostering water based activities, namely in this part of the river/city. Very knowledgeable as actual users of the river. Will be important for development of solutions. |
| | Representative of the Bloom Moovement | | ☒ | | | ENGO focused on environmental awareness for the school community through immersion in forest environments. Not planned in our stakeholder mapping, invited for workshop by recommendation of other stakeholder. Her ideas were crucial to our solution. Will try to keep them engaged. |
| Maritime scouts local group | | | | ☒ | ☒ | Not present in initial mapping; less involved than we were expecting (because of time constraints), but committed to participate and interested in co-creation. Very knowledgeable as actual users of the river, crucial for development of solutions involving immersive uses of the river |
| Local newspaper | Director of "Notícias do Parque das Nações" | | ☒ | ☒ | ☒ | Easy to engage with, thanks to shared interest in fostering water based activities, namely in this part of the river/city. Very knowledgeable as actual user of the river. Will be important for dissemination, engaging local residents. |

# Cube

## Exploring

Quality of life, ageing society vs ageless society, social innovation, Loneliness vs connectedness, social inclusion / empathic society, Open mind towards the future, citizens participation

## 8. Cube – Continium journey

Cube design lab addressed current and future challenges that are relevant within the broader context of an ageing society. Through a combination of literature research, observations, conversations and workshops with multiple stakeholders including citizens, policy makers, designers and researchers, Cube reframed and specified the challenge as follows:

*How might we increase/ensure the quality of life of people of all ages living and growing up in the context of an ageing society, now and in the future, drawing on the self-organizing potential of the community in co-creation with policy makers, by broadening perspectives and providing an open mind to the future starting with a pilot in Voerendaal?*

Engaging multiple stakeholders was a major part of the co-creation journey, which involved considerable time and effort, drawing on Cube's existing networks and building trust and relations through personal contact.

The main tool being used in the first three phases of the co-creation journey was the frameboard canvas, which helps to keep reframing the challenge, changing perspectives, while both problems and solutions co-evolve.

Within the workshops and in-between the different stakeholders, the relations between these stakeholders became the main focus and Cube came to realize that co-creation could be part of the solution beyond this journey. In the prototyping phase we will further explore a more sustainable infrastructure/ programme that connects citizens, policy makers and ideas to tackle (future) challenges related to ageing societies in a participatory and democratic way.

## 8.1. Cube design lab's journey implementation

### 8.1.1. Phase 1: Analyzing the context

- Process and methodology

To analyse the context of social challenges related to an ageing society, we have collected and analysed several research and policy reports about ageing and loneliness (from local, to national, EU and global level), in addition to demographic statistics.

Parallel to collecting and analysing existing data and knowledge about ageing, we organized informal workshops with approximately 25 citizens visiting Cube design museum to explore (social) challenges and needs related to ageing and possible solution ideas, to further re-frame the challenge.

Also in parallel, we contacted 7 different (potential) stakeholders (policy makers, researchers, designers, entrepreneurial citizen) and had several informal/exploratory talks with them to both further frame the challenge AND to explore the possibilities of participating in the co-creation journey.

We organized a pilot workshop with students from Maastricht University (Maastricht Disrupt and Faculty of Arts and Social Science) to both test the methodology of using the frameboards and to further gather insights for reframing the challenge.

After we made contact with the local policy makers of the municipality of Voerendaal, we did some preliminary observations at the neighbourhood support points, where the city's aldermen hold 'open office hours' for citizens and social activities for citizens are being organized.

- Main outputs and results

The analysis of the literature (reports, books, statistics) is captured in the table with key facts (see below). Together with the results from the workshops and conversations, the main outputs and results consist of insights in the complex matter of ageing, loneliness, and related human needs and challenges.

We also gained a preliminary understanding of the needs and context of policy makers of Voerendaal. (*see Annex p. 42*)

In addition to needs, we collected a number of preliminary solution ideas.

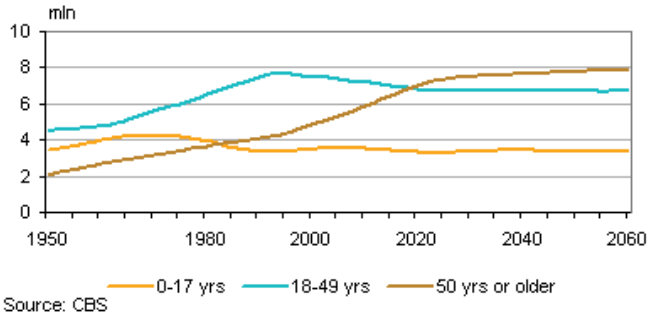
Most importantly, however, the main result of this phase is probably a more clear understanding of potential stakeholders and a multidisciplinary team of committed participants (no picture unfortunately).

*Table 52 Synthesis of Cube*

| | |
|---|---|
| Theme | Quality of life, ageing society vs ageless society, social innovation, loneliness vs connectedness, social inclusion / empathic society, open mind towards the future, citizens participation |
| Needs | - local policy makers need to make the transition towards a more participatory society and way of policy making<br>- local policy makers need insight in future needs of community/citizens<br>- local citizens want acknowledgement and support of policy makers<br>- local citizens want certain services in their neighbourhood, like a grocery store and a primary school<br><br>This translates into some (basic) human needs of citizens in the context of an ageing society:<br>- self-direction + relevance for society<br>- acknowledgement + appreciation<br>- empowerment + ownership |
| Key evidences | - facts and figures related to ageing and loneliness<br>- recurring themes being mentioned by different (types of) stakeholders<br>- other (similar) initiatives being addressed in other places (e.g. Dorpslab, Stadslab) |

Some concrete facts and evidences related to ageing:
People are getting older, according to a report of the United Nations the old age dependency ratio (people aging above 65 per 100 people between 15 and 65) has been on a rampant rise over the years. In the year 2005 this ratio was 11.3, in 2010 it was 11.7, and it is expected to grow further- by 2020, it will reach 14.4 while by 2030, it will be touching a total of 18, this is a global issue. Every country is experiencing ageing population growth and will be affected proportionately by it.
We may not realize this now, but population ageing is set to become one of the most consequential social alterations in the age of humankind. Improvements in the overall quality of life and medical advances have helped older people to live longer. While ageing is a worldwide issue, the process is at a more advanced stage in some countries of Europe and Asia. Regardless of the region, population ageing affects various aspects of daily life- healthcare, pension, retirement, housing, transportation and so much more.

*Age composition of Dutch population:*




Source: CBS

According to "Statistics Netherlands" population forecast, 2019 will be the first year in which half of the Dutch adult population will be older than 50 years. In many Dutch municipalities more than half of the population are already over 50. In 2019 6,9 million of the nearly 14 million adults will be older than 50 years.
On 1 January this year, over 16.8 million people were living in the Netherlands. The share of the adult population has risen steadily in recent decades. In 1950 less than two-thirds of the adult population were 18 years or older; today this is nearly 80 percent. Some populations age faster than others. Om 1 January 2014, over-50s accounted for more than half the adult population in 264 municipalities. These municipalities are mostly located in the province North Holland, Friesland, Groningen, Drenthe, Zeeland and South Limburg.
If in 2010 there were 11 million people not older than 50 years and 6 million older than 50, in 2060 there will be resp. 10 million and 8 million. The total population is growing by 1 million people, but the over-50s by 2 million. This change in aging causes many changes and movements in society; moreover, not all elderly people are stiff, but they are mobile. This leads to many opportunities, as long as you want and can see them as an entrepreneur, marketer, product developer and communication expert. Looking around society, getting to know the target group of the elderly well and not just using your own frame of reference are crucial to developing catchy new concepts and services for the aging society and to be able to communicate well with this target group. The elderly are not risk averse with regard to innovations, but they are selectively innovative: the new must match their lifestyle and this may differ per target group.

So far, many products and services are being developed for the elderly that are related to physical aging (what can no longer be done): all kinds of aids. But there are of course many more chances and opportunities to increase both the convenience and the quality of life for a target group that does not want to be addressed explicitly about old age. In this regard, referring to the values of an aging population is crucial.

**Main policy elements**

- complexity of public engagement and difficult relation between policy makers and citizens: both argue that participation and co-creation is important and valuable, but are cautious when it comes to responsibilities and expectations
- both citizens and policy makers keep thinking and acting within their current frames and have difficulties exploring new/different future possibilities

### 8.1.2. Phase 2: Reframing the problem

- Process and methodology

First of all, we have organized a co-creation/framing workshop with 8 local policy makers from the municipality of Voerendaal to explore their perspective on the challenge within the context of the village of Ransdaal, which is part of Voerendaal.

Secondly, we contacted and had conversations with a citizens' cooperation called 'Ransdaal voor Elkaar', which consists of a group of enthusiastic and active citizens who initiate projects to improve the quality of life of Ransdaal.

We have then built on those insights by organizing a co-creation/framing workshop with 10 trainees of the Province of Limburg, who represent the future generation of local and regional policy makers, to further reframe the challenge based on the combined insights of the policy makers and the citizens.

Furthermore, we have discussed and reflected on the results together with Neimed (regional knowledge and expertise centre regarding demographic changes and public engagement), and with our partner researchers and designers, in addition to some exploratory conversations with a local entrepreneur who is looking for opportunities to approach the issue of ageing in a different and innovative way by bringing together knowledge and services in an empty historical building of Voerendaal.

- Main outputs and results

The main tool we have used and continue to use during this journey is the Frameboard Canvas, to capture and reframe both challenge and possible solution spaces and ideas. In addition we have used the stakeholder profile canvas to help workshop participants define their users. (see pictures in the annex II p. 43). Furthermore, we made notes and wrote short reflections on discussions and workshops and shared them among the team.

During the phase 2, the challenge has been reformulated, reframe as show the following table.

*Table 53 Cube Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | How might we increase the quality of life of people living and growing up in an ageing society like Parkstad (South Limburg region) and more specifically fight loneliness? |
| Synthetic formulation of the reframed challenge. | How might we increase/ensure the quality of life of people of all ages living and growing up in the context of an ageing society, now and in the future, drawing on the self-organizing potential of the community in co-creation with policy makers, by broadening perspectives and providing an open mind to the future starting with a pilot in Voerendaal? |

*Table 54 Cube key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| Municipality of Voerendaal | - a social and sustainable municipality<br>- together with citizens, companies, associations, and villages invest in a city where it is nice to live and work, where people can count on each other, where initiative is appreciated, where healthcare and support is provided, and where criminal activities are being eliminated. | - gain insights in needs of citizens in the context of how to make the villages of Voerendaal future proof<br>- addressing (future) societal challenges related to the 'participation society'<br>- possibly new ways of policy making |
| Citizens' cooperation "Ransdaal voor elkaar" | - increase and maintain quality of life for all citizens of Ransdaal<br>- influence policy making, in regard to their own life/ in their own neighbourhood/village | - possibility to increase support among citizens<br>- possibility to increase knowledge about co-creation methods<br>- possibility to increase commitment from municipality/policy makers |
| Neimed | Neimed is a Centre of expertise on Demographic Changes and is a joint initiative of Zuyd University of Applied Sciences, and the Open University in the Netherlands. They<br>- collects expertise in the Netherlands and beyond with special emphasis on the City Region Parkstad Limburg.<br>- tackle issues related to demographic change: significant population decline, ageing population, declining of the work-age population<br>- support the quality of life of citizens and communities in shrinking areas and identify constructive scenarios derived from the mentioned demographic processes | - develop and increase knowledge base about quality of life in ageing society and new possibilities for citizen engagement and co-creation |
| Studio hyperspace | - studio hyperspace seeks for new ideas and practices that are in tune with the chaos and acceleration of our time, by establishing an a-disciplinary network of sociologists, designers, artists, researchers, teachers, and creatives that share the same feeling: do meaningful stuff. | - 'do meaningful stuff'<br>- gain experience and knowledge<br>- increase network |
| Studio kernland and Other designers | - designers want to 'make a difference' and are driven to use their abilities and skillsto find solutions for small and big human challenges<br>- studio kernland is one of those designers, focusing on exhibitions design and storytelling | - 'do meaningful stuff'<br>- gain experience and knowledge and expand portfolio |

### 8.1.3. **Phase 3: Envision alternatives**

- Process and methodology

First of all, it is important to understand that in our journey, all the phases are very much intertwined, which means that envisioning alternatives already starts when analysing the context. So every workshop and talk/discussion in the previous months contributed to generating ideas. There are no 'sharp' borders between the different phases.

We organized informal talks and creative reflections with our partners, including Neimed, Studio Hyperspace, Studio Kernland, and internal staff, to synthesize the findings of all the workshops and research in previous phases and define preliminary directions.

Furthermore, based on the reframed challenge as described in the previous paragraph, we organized short co-creation workshops with citizens who visited Cube design museum, to receive first feedback and reflections on how to create more equal and productive relationship between citizens and policy makers in regards to increasing the quality of life of all citizens in an ageing society.

- Main outputs and results

In total we have co-created 6 frameboards, and many more ideas, either on post-it notes, or in small CREATE-templates, or as notes of personal conversations.

Most of all, this phase for now results in a change of perspective of what kind of solution we are looking for, without defining a concrete idea.

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

The outcome of the journey is much more messy and complicated than a list of ideas and a selection of the best one, especially because we focus on social innovation with the help of activities and/or technology.

*Table 55 Cube ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities | - |
|---|---|---|---|---|
| Gamification | All ages within a certain community: Neighbourhood, village, etc. | Product - Technical/ social | Easy access, challenging and "edutainment" factor Help people to see new future possibilities | ICT is not for everyone Time/ costs for development |
| Ransdaalder, social coin for the support and realisation of bottom up initiatives within a community (experimentation budget) | Support of the crowd + policy makers | Program (events) and IT product Social – IT focussed | Combination of different forms (physical events, IT product, etc.) which can have a long term effect within the community | Important that policy makers are willing to hand over a part of control to citizens and are open for experimentation and "trial and error". |
| Ransfest | Events in which sharing, cooperations, social interaction and podium for innovative ideas | Physical event in community | Social event with lots of possibilities for interaction and new initiatives | Not really innovative. Questionable longterm/ sustainable effects |
| Reflective mirror | Lonely people (of all ages) finding support and confirmation | Product - Using smart technology in home environment for social challenge | Low threshold for social interaction for lonely citizens. Coaching in dealing with loneliness based on the own experience/ challenges | Complex project, involvement of a lot of data. Needs professionals, specialists and extensive funding. Effectiveness not tested yet. |
| Knowledge/ entrepreneurial/ lab environment. | Entrepeneurs and citizens of all ages which can start their own business, events, activities with a strong focus on social interaction. | Built environment and programs. Permanent Physical Space buildings in which social and entre-preneurial activities take place | Unique long term development which creates a permanent space for citizens of all ages to use services or initiate own projects | Big investment, extreme commitment from policy makers and other stakeholders. Only possible with own of potential buildings/spaces. There are examples of other project/initiatives. |
| Pop up facilities for daily needs like groceries and shopping, but also advice, social interaction, meeting and exchange of ideas/values/expertis e/knowledge/etc | Social cohesion, meeting space and facilitating bottom up initiatives from citizens. | Temporary physical space in combination with (social) programs. | For everyone accessible, low threshold for participation good way to reach parts of community who are not "sensible for the message" | Involvement of (commercial) owners of facilities in which the " pop up activity" take pace. |

## 8.2. Solution: the selected idea and future steps

| *Name of the Lab's solution* |
| --- |
| **Future Citizens Lab x Ransdaal - Toekomstburgerslab x Ransdaal** |

# What?

**Description :** A 'programme' that combines a new policy structure/system with (social and educational) activities and an IT-product, which aims for social innovation: bottom-up initiatives from citizens of a neighbourhood or village are facilitated and supported by policy makers of their community. This requires new policy frameworks in terms of both financial and organizational support, as well as manpower/logistics.

- The proposed programme consists of 3 main parts:

A workshop for citizens centred around setting up social innovative proposals by using for example design thinking and the value proposition canvas.

- An event (e.g. in a community center or pop-up facility like an empty shop) in which ideas can be presented by citizens to fellow citizens and policy makers of the neighbourhood, district or village in which the project would be realized.
  A digital environment in which citizens can give their support to initiatives/projects. For example, by investing ***'socoins'*** (analogy of social bitcoins) by means of which they can indicate that they want to support the initiative. In addition, to make the support stronger and more direct, citizens should offer their cooperation (in time and efforts) in realizing the initiative.
- The solution is a combination and some addition to already existing projects. The addition is mostly in the workshop, which gives citizens the tools to assess and develop their ideas, the way of voting and getting involved for other citizens and the use of 'socoins' as a way for the policy makers to support bottom up social innovation by supporting of citizens' initiatives. Parts of the prototype are based on a range of existing projects; we build further on the experiences of these projects and some participants of these existing projects are involved in the current project of SISCODE.

**Type of prototypes:** Workshops, services, products (digital and physical environments)

# Why?

- Local policy makers need to make the transition towards a more participatory society and way of policy making
- Local policy makers need insight in future needs of community/citizens
- The need to develop into a " Participation society"
- Local citizens want acknowledgement and support of policy makers
- Local citizens want certain services in their neighbourhood, like a grocery store and a primary school
- Self-direction + relevance for society
- Acknowledgement + appreciation
- Empowerment + ownership

An ageing society brings about new needs and challenges that require new ways of realizing all kinds of services, products or concepts (see also paragraph: key evidences). Dutch governments (national,

regional, local) are more and more focusing on the 'participation society' in which citizens have to carry more own initiatives and responsibilities. This demands a stronger involvement of citizens, while policy makers are not always on the same level of knowledge or openness to these new ways of policy making and execution.

# How?

**Activities:** First, we will continue with stakeholder engagement, both on the level of policy makers and citizens. We are collaborating with the citizens cooperation ***'Ransdaal voor Elkaar'*** to find ways to reach a broader share of the population of the neighborhood of Ransdaal and involve them in the prototyping phase. We will present the idea as described in the previous paragraphs to the municipality of Voerendaal and the cooperation of Ransdaal. We want to organize a workshop with both the policy makers and citizens to discuss the idea and explore and define how to continue and who will support the further development and prototyping.

Secondly, if the basic idea of the three stages (workshop, event, digital environment) is still the same, we will start prototyping the workshop, using our network of (design and entrepreneurship) professionals to define the tools experiment with them. Here it is also important to engage a number of enthusiastic and entrepreneurial citizens with ideas. Once we have a number of such citizens and ideas, we can organize an event for presenting the ideas and once again involve both citizens and policy makers. Developing and prototyping the digital environment will have to be organized in parallel.

All in all it is important to keep in mind that it is an iterative process. We need to be flexible especially during the coming two or three months to keep open possibilities to adapt the ideas based on feedback and input from different stakeholders. We need to have an open mind in which not the initial idea is the goal but the development and realization of a program/product that brings together policy makers and citizens in a sustainable way.

We start in a small more rural community, named ***Ransdaal***, were 900 people are living. ***Ransdaal*** is part of a bigger village called ***Voerendaal***. We will research the roll out of the results/finished prototype in the "Parkstad Limburg" organisation. Parkstad Limburg is a cooperation of 8 villages/cities, one of them is ***Voerendaal***.

**Main stakeholders and responsibilities:** Policy makers in neighbourhoods, city and Provincial level, starting with the policy makers of the municipality of Voerendaal.

Citizens of Ransdaal/Voerendaal, social organisations, (social-) design professionals, community managers (Brookers).

**Budget:** The first estimation is that the current budget should be sufficient for the realisation of the prototype (mainly workshops, workshop material, workshop and event locations and catering, manpower). The prototype for a digital environment could be designed by an intern.

**Data collection.** We will measure and evaluate output and outcome of the use of the prototype, in particular focused on the number of participants from the different stakeholders and the involved citizens in relation to the focus area. In relation to the context of an ageing society, it is important that the results address some of the needs that go along with these new future challenges. Thus we will assess the result of the prototyping phase in terms of:

1) number of participants and types of stakeholders involved;

2) diversity of citizens involved;

3) relevance of proposed initiatives for ageing society (i.e. not just 'doing nice things');

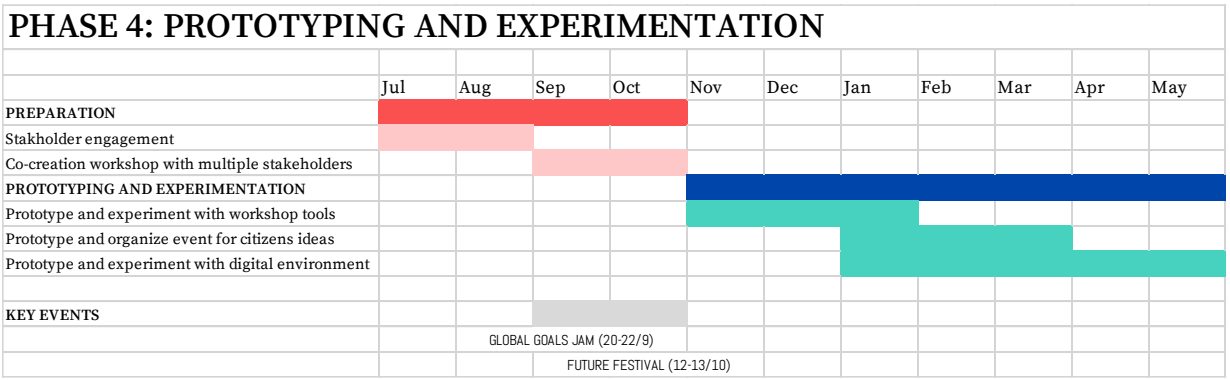
4) degree to which prototypes lead to change in policy making and policy implementation.

The precise way of collecting data and measuring results will be further defined during the prototyping phase and depends partly on how the idea will develop in co-creation with the different stakeholders involved.

# When?

**Duration.** The fourth phase runs from September 2019 until May 2020.

**Times scope**




# Comments

Main risk/ remaining challenge is to get sufficient commitment from both citizens and policy makers to further explore and develop a new way for the community/ society to live together and address future needs of ageing society (i.e. thinking beyond existing frames and willing to experiment and take risks).

Once both citizens and policy makers agree on the relevance and are willing and able to commit and invest some time and effort, we can work together to concretise the idea and start the actual prototyping and experimentation phase.

In the long run, the main challenge is real involvement of policy makers: a big question they have is 'what happens' after the SISCODE project. Will the outcome of the SISCODE project be a real solution or just another research result with no implementable outcomes. Policy makers, citizens and other stakeholders are very reluctant to participate and invest time into a research project which will have no concrete results or is in line with their own goals/plans. Big questions is "What is the sustainability of the project after the end of SISCODE and will we have usable outcomes, activities, projects, etc.

*Please see Annex II p44-45 for the complete description of the idea canvas and the Experimentation Canvases.*

## 8.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

Co-creation and a co-creation journeys are not high on the agenda of policy makers in Limburg. In most cases participations stops with consulting and talks with citizens and politicians and civil servants do their usual job. At this moment there are no cases known in which the whole co creation journey has taken place with involvement of different stakeholders and policymakers. Although citizens participation and creating responsibility for their own (social-) environment at citizens level is more promoted.

Public engagement is very much part of the official policy of the municipality but practice is much more complicated than theory. Policy makers are struggling with how to give room for bottom-up initiatives and ownership, without giving up their public responsibility, as well as with thinking beyond existing frames.

Co-creation is felt by citizens as a 'one-way' approach. It feels like input from citizens is appreciated and needed, but decisions are made by policy makers alone. This needs a major shift.

There are some projects in which the bottom up approach has led to successful citizens participations and initiatives. We will work together with these projects initiators, because they are good examples of " best practices" which can help to inspire and motivate other local councils and civil servants.

- Engagement with policy makers

Policy makers should be part of our co creation journey and to get them on board takes a lot of time and efforts. It is important to find "common ground" and to make sure that their goals and wanted results are the same as ours. We connected to policy makers over our networks, partners, intermediaries and (social-) organisations. The first step was to get introduced via existing network partners and other stakeholders.

When arranged a meeting it is important to research and find out what their objectives and long term goals are on the topic you want to work on together. They have to be aware that cooperation within the project gives them some advantages and helps to reach their own goals. In these processes we have experienced that the cooperation between politicians (city councillors) and civil servants are a delicate ground. Sometimes the policy makers want to work together but the civil servants are afraid of extra work load, sceptical about the outcome or just not convinced that co-creation is the way to go. As mentioned before "change management" could be an important issue within these sorts of co-operations and help to overcome bigger issues. We have experienced that personal preferences can be of major influence on the process and the involvement of policy stakeholders.

- About the policy gaps and suggestions

*Table 56 Cube: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Openness for experimentation | Change management |
| Negative experiences from past co creation projects | Difficult to change |
| Time for experimenting | Early start and planning enough time |
| Believing in the "old fashion" approach the city council and the civil servants know what is the best approach / way of working. | Change management |
| Although there are regional and national schemes for aging society and, for examples, loneliness they are often a top down approach (certainly on a national level) | Avoid stigmatization, goals and target groups for activities should be broad and age independent (certainly if you want to reach |
| Work on their "fear to failure". | Part of the project/cooperation is learning from failure |
| Funds to experiment | Convince policy maker that they have to take some kind of risk to facilitate co creation journeys |

- Future actions and suggestions for WP4 workshops

Change management and innovation management are necessary skills which have to be developed.

Showing best practices of co creation projects in policy makers' own field of responsibility.

Expectation management in the field of policy makers and together with citizens

## 8.4. **Monitoring of the process**

- Synthesis of the activities

*Table 57 Cube: Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments (any changes D3.1?) |
|---|---|---|---|---|---|
| **Phase 1** | 1.1 prepare the research<br>1.2 research (data collection<br>1.3 research (data synthesis and analysis | - workshops<br>- interviews<br>- literature review (key facts)<br>- frameboards<br>- informal talks<br>- participant observation (POEMS, five human factors) | - knowledge and insight about context and methodology<br>- team of dedicated partners<br>- 2 completed frameboards<br>- notes<br>- PPT-presentations | 97 | Stakeholder engagement took more time and effort than expected. This slowed down the process and therefore left less time to visualise outcomes and also meant that in this stage of the journey it was not feasible nor required to focus on individual, ethnographic stories.<br>It is also important to take into account that when designing our co-creation journey plan, we listed a number of tools that might be helpful in each stage, without the intention to actually use ALL of them, because it is an iterative and unpredictable process. |
| **Phase 2** | 2.1 (visualize &) interpret data<br>2.2 reframe the problem<br>2.3 frame opportunities | - presentation/ workshop discussion<br>- frameboards | - 2 completed frameboards<br>- notes, summaries, reflective reports | 30 | Stakeholder engagement took more time and effort than expected. Therefore less time to visualise outcomes.<br>When designing our co-creation journey plan, we listed a number of tools that might be helpful in each stage, without the intention to actually use ALL of them, because it is an iterative and unpredictable process. Still those tools might be worth exploring more in the future. |
| **Phase 3** | 3.1 Generate ideas<br>3.2 Refine and select ideas<br>3.3 Generate solution approach for prototyping | - presentation/ workshop discussion<br>- frameboards | - 2 completed frameboards<br>- notes, summaries, reflective reports<br>- list of ideas, and rough sketches on post-it notes | 30 | See comments above about time management.<br>In addition, due to the requirement of SISCODE to deliver one solution, we aimed to combine the most promising ideas into one frame, instead of working out 2 or 3 alternatives. |

*Table 58 Cube Stakeholder engagement table*

| Type of Stakeholders | Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|---|
| | | Co-producing | Co-designing | Consulted | Informed | |
| Social innovation | Neimed | ☒ | ☒ | ☒ | ☒ | Research body on ageing society and relating societal changes. Has already executed various citizens "bottom up" projects in the field of policy making/change |
| | Studio hyperspace | ☒ | ☒ | ☒ | ☒ | Designer, teacher University for applied sciences and digital society school and social scientist. |
| Research | Silverbrains | | ☒ | ☒ | ☒ | Silverbrains is a platform where companies, institutions and governments meet, both physically and digitally. The platform is aimed at exchanging (international) knowledge and working together to develop new products, services and service processes for people over 50. |
| | Neimed* | ☒ | ☒ | ☒ | ☒ | |
| (social) design | ORV Consulting | ☒ | ☒ | ☒ | ☒ | Designer and creative thinker |
| | studio kernland | ☒ | ☒ | ☒ | ☒ | Designer and creative thinker |
| | Organisation 'Maastricht Disrupt' | | ☒ | | ☒ | Foundation focused on activities, conferences, events in the field of innovation, design thinking, etc. |
| | Students Maastricht University | | ☒ | ☒ | ☒ | Faculty of Arts and Social Sciences |
| Policy makers | Municipality of Voerendaal | ☒ | ☒ | ☒ | ☒ | Main stakeholders |
| | Policy trainees Province of Limburg | | ☒ | | ☒ | Secondary stakeholders |
| | Other Policy makers | | | | ☒ | Secondary stakeholders |
| Citizens | Cooperation Ransdaal voor Elkaar | ☒ | ☒ | ☒ | ☒ | Main stakeholders |
| | Visitors Cube & participant activities | ☒ | ☒ | ☒ | ☒ | Main stakeholders |

# SCIENCE GALLERY DUBLIN

Exploring

Young People, Open Mind
Stress, Anxiety, Depression, Mental Health,

## 9. Science Gallery Dublin Journey

### 9.1. Science Gallery Dublin's journey implementation

Our challenge was to improve mental health and well-being with young people, as 75% of adults with mental health problems will show symptoms before they are 25 years old. We decided to give our co-creation journey a brand identity and named it OPEN MIND – something we thought captured the topic of both mental health and the process of co-creation.

We split our co-creation sessions with stakeholders into three separate events: Idea Generation, Idea Refining and Idea Prototyping spaced over two months. We had no specific challenge of mental health that we wanted our stakeholders to solve. Instead, during the research in Phase 1, we captured as many different mental health and well-being issues we could by interviewing academics, NGO's, psychologists, parents, teachers, college and high-school students. We presented these issues to the group of stakeholders at the first OPEN MIND session and allowed them to choose which to work on.

During the Idea Generation, Idea Refining and Idea Prototyping sessions, the stakeholders chose to focus on mental health and well-being for high-school students, and generated many ideas like a mental health festival, having more lessons outside, and creating hobby clubs.

The final idea that was selected was to run a pilot programme in 4-5 schools where Transition Year students (15-16 year olds) will be trained in co-creation, mental health awareness, leadership, and inclusion. They will be tasked with setting up a hobby club in their school for First Year Students (12-13 year olds) and to be mentors for them. The hope is that the use of hobbies, which have been shown to improve mental health and well-being, and the relationship building between older and younger students, will increase empowerment and the overall atmosphere of the school leading to increased well-being and fewer mental health issues.

### 9.1.1. Phase 1: Analyzing the context

- Process and methodology

In order to analyse the context, time was spent investigating the landscape of mental health for young people in Ireland, looking up official reports and statistics, and current policy documents. This information was compiled into two blog posts shared on the SISCODE website.

A list was created of all the relevant stakeholders in the field and one-to-one meetings were carried out. SGD met with 34 individuals, including academic researchers, psychologists, staff from counselling services and mental health charities, youth social worker, mental health policy makers, and a national youth advisory panel. We carried out focus group with teachers and parents, and also circulated a survey to gather information from these stakeholders. We also used a survey for 18-25 year olds.

The theme of mental health and well-being was used during three educational workshop weeks for a total of 60 students aged 15-16 years old. SGD staff practiced using the co-creation tools, but mostly used it as an exercise to collect thoughts and feelings of young people on mental health and well-being.

We used Word Clouds and Lucid Chart to create our visualisations and spent a slot in the first session presenting all this information to the stakeholders so that they could all be on the same page before ideation.

- Main outputs and results

Our main outputs from Phase 1 were transcripts from the interviews and focus groups, which we used to create proto-personas and mind maps. We collected words/phrases through our educational programmes and surveys which we turned into word clouds. Example: What do you think of when you think of mental health and well-being? See Annex II p. 47.

*Table 59 Synthesis of SGD*

| | |
|---|---|
| Theme |  |
| Needs |  |
| Key evidences | • 75% of adults with mental illness first experience symptoms before the age of 25<br>• Peak onset is 18-25 years old<br>• Ireland has the fifth highest suicide rate in Europe<br>• There are huge waiting lists for child and adolescent psychology at primary care level - current figures around 6,000, ⅓ over 1 year waiting<br>• Specialist service access (CAMHS) 2,500 on waiting list currently, 10% waiting over 12 months |
| Main policy context elements |  |

### 9.1.2. Phase 2: Reframing the problem

- Process and methodology

SGD used many activities to generate ideas, refine the ideas and select one chosen idea as a group, which they then defined together. The activities were based upon the 101 Design Methods (the numbers of which are referenced throughout this document), and were carried out over three sessions: Idea Generation, Idea Refining and Idea Prototyping.

During the first session, the results from Phase 1 were presented to the group, and co-creation and the SISOCDE project were explained. The participants were divided into six groups with all the different kind of stakeholder groups mixed together. There was a wall covered with the individual challenges that were highlighted after the analysis in Phase 1 e.g. eating disorders, LGBTQ+, transitioning from child to adult health services.

Each group had the opportunity to vote with sticky dots which of the challenges they would like to explore more deeply. They were also told that if they wanted, they could also come up together with a new challenge if they felt it wasn't represented from the available phrases. They then removed the challenge from the wall (ensuring that another group didn't also cover this challenge) and had 8 minutes to create a conceptual map for the problem. They then repeated this for three separate challenges (Method 5.2).

- Main outputs and results

By allowing the group to vote individually for which challenge they wanted to explore, it allowed democracy within the group. They were also clearly advised that it could be possible that Phase 1 had missed some challenges and were encouraged to create their own if they thought so – meaning that hopefully no important challenges were missed.

The conceptual mind maps were useful to produce an overview of each individual challenge, and from these we were able to create a list of more specific problems and stakeholders within these challenges. The stakeholders also got to know each other, the context of the overall challenge, and were introduced to the co-creation journey.

*Table 60 SGD key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| S1 Young People | Navigating transitioning from adolescence to adulthood, along with all the pressures of school/university/career. | They first got involved during the educational workshop weeks and were interested in having a say on the topic. |
| S2 Academic Researchers | Conduct research, lecture, write publications and disseminate research. | Learning about the co-creation process. |
| S3 NGO Staff | Working in lots of different mental health areas such as prevention, suicide and eating disorders. | Learning about the co-creation process. |
| S4 College Welfare Officers | Usually post-college students who stay on for a year to take on the role, really care about the community of students and their mental health. | As they work as the welfare officers in colleges across Dublin they have a lot of insight into issues for college students (and are of student age). |
| S5 Clinicians | Clinician's mission is to help those with mental health problems, sometimes they can also be researchers. | Very busy, so were difficult to engage, but were all enthusiastic about making a change for young people. |

*Table 61 SGD Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | To improve mental health and well-being management with young people |
| Synthetic formulation of the reframed challenge. | To improve mental health and well-being management with young people in a secondary school setting. |

### 9.1.3. Phase 3: Envision alternatives

- Process and methodology

From the conceptual map the stakeholders drew when they were reframing the problem, they generated two different coloured post-its – one for the defined problem within the overall challenge, and one for the stakeholders within the challenge. They then individually had to rapidly write as many hobbies and technologies they could think of on another colour of post-it.

As a group they had to randomly select one of each of the coloured post-its (problem, stakeholder, hobby/technology) and had 2.5 minutes to ideate a solution (Method 5.5). They were required to draw their solution and come up with a name. This process was repeated five times to generate five separate solutions.

The groups then had 30 minutes to "pivot" any of these ideas – to change either the user, or change the idea to be more realistic or impactful. At the end of this session they were introduced to the Concept Evaluation tool (Method 6.2) and placed the ideas on their own individual canvas with the axes "Impact" vs "Feasibility". The scores were then added up depending on which quadrant the ideas were placed into, and the idea with the top score was determined. If there was a draw between two ideas or more, the group discussed together which one to select to move forward with.

After this the groups used an adapted "Business Canvas" to expand on the chosen idea, identifying required resources/requirements, goals it would achieve, how to measure impact etc. They were also required to produce a Concept Sketch (Method 5.13).

Each group presented back to the whole group of stakeholders and a panel of selected external advisors. In preparing for their presentations they were encouraged to use the Solution Enactment (Method 6.8). There was a time for questions and answers at the end of the presentations.

Main outputs and results

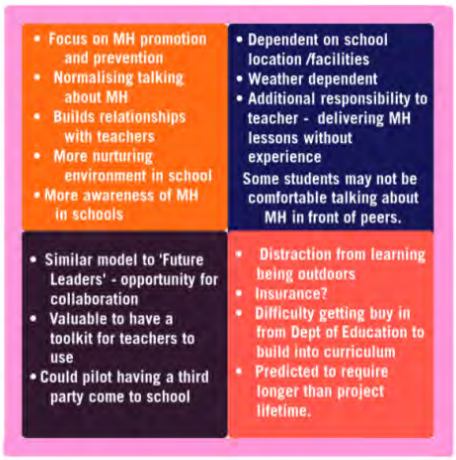
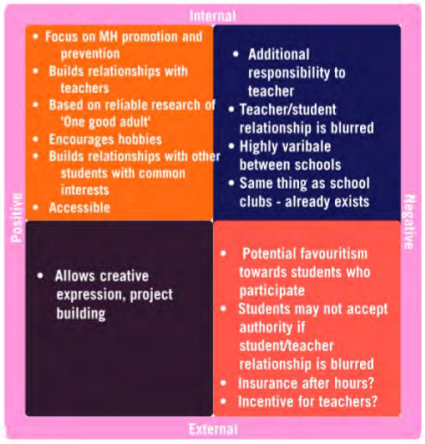
At the end of the first Idea Generation session the six groups presented back their ideas to the whole group, and were surprised to see the overlap between the ideas generated, even though they all selected different challenges for the ideation section. The groups all focused on mental health and well-being in a high school setting.

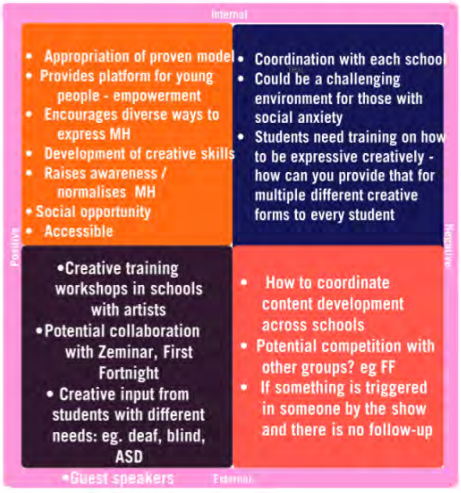
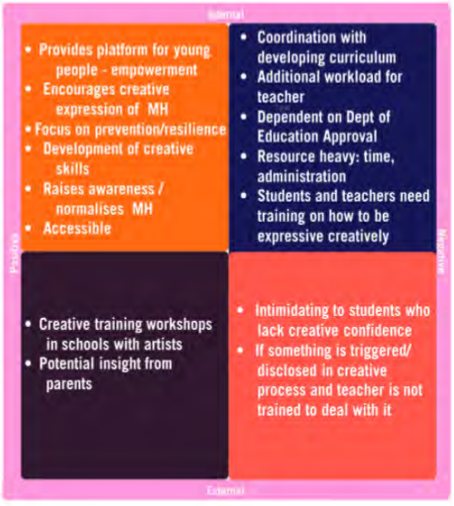
The main output from this stage were the ideated solutions along with the drawings and the creative names.

(See Annex II p. 47 for picture and ideation drawings…)

The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.

*Table 62 SGD Ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value) + opportunities - |
|---|---|---|---|
| Nature Nurture | – Target MH in school setting, to promote young people to be outdoors | Well-being programme in schools, well-being modules are designed and all classes are taken outdoors, outside of classroom environment<br><br>Template/plan for teachers<br>Piloted in TY and 5th year |  |
| Growing Connections | – Promote connectedness between students and teachers<br>– Promote student-student connection<br>– ↓ isolation<br>– Development of new skills<br>– Sense of purpose/tangible achievement in hobby<br>– Encourage identification of 'one good adult' | Programme of activities in a school outside classroom hours for hobbies eg. knitting, chess |  |
| Students for Reform | – Targeting exam system as major source of stress for young people<br>– Setting up a national council of students who will come together and discuss issues and solutions in relation to the current exam system in Ireland<br>– Each school in Ireland has its own representative | National Committee |  |

| | | | |
|---|---|---|---|
| INclude | – Bring together young people<br>– Promote awareness of MH issues<br>– Multidisciplinary approach with creative and artistic events/installations | Festival |  |
| Original Adventurers | – Programme that delivers outdoor adventures to promote use of nature as a MH coping resource | Programme |  |
| SuppART New Perspectives | – Course taught in secondary school on science of MH and how to deal with challenges with an exhibition of creative outputs at end of course.<br>– Website for awareness | Programme |  |

## 9.2. The selected idea and future steps

| Name of the Lab's solution |
| --- |
| OPEN MIND (The stakeholders chose this themselves, inspired by the name of the process.) |

# What?

It consists of in-class modules with Transition Year students, to equip them to set up lunchtime clubs and partner with first years to work on it together. It is different as it is empowering the young people to understand the importance of hobbies for their mental health, and using co-creation techniques for them to be innovative in facilitating the clubs themselves. It provides a link between older and younger students for mentorship.

The prototype will be a pilot programme that acts as a service within a school.

# Why?

To improve mental health and well-being management with young people in Ireland.

There will be a direct value for the school, and especially the students taking part in the programme. We hope that it will influence local policy within the school to improve the overall mental health of pupils by fostering an inclusive environment that is based on hobbies.

We also hope to influence policy makers who are in the current Civil Service reform programme and are interested in how co-creation could be used as a new way to influence policy.

# How?

**Activities:** The pilot programme in schools will be implemented in 4-5 schools in stages. There won't necessarily be a small and large-scale prototype, instead SGD will review how the pilot is progressing. If it is decided that a second version of a prototype should be carried out to test any changes, this could be conducted in the beginning of the new year in January 2020 with one new school.

Stage 1 – The introduction of co-creation by SGD to the class. After this the teacher will use the provided modules to continue the training of the students on the other topics e.g. leadership, mental health, creating a welcoming environment.

Stage 2 – SGD will meet with the class to review how they are getting on, and to discuss next steps in setting up the hobby club. The students will then be in charge of implementing this.

**Main stakeholders and responsibilities:**

Academic Clinical Psychologist: Creating module on mental health and supervising Masters student who will carry out the evaluation research.

Previous Transition Year students: To feedback on content and act as ambassadors for the programme as it is piloted in their schools.

NGO for Body Image: Experience in building modules for schools.

**Budget:** A lot of the cost will be personnel time of SGD staff who train the teachers and students in the co-creation process. Each school running the pilot will have a small budget to be able to use it to bring in any experts necessary to run training session for the hobby club. SGD has free access to an online module builder, which will be used to create the modules for school – this would have cost >€1,000.

**Data collection.** We will carry out pre- and post- surveys of students to see if the OPEN MIND project makes a difference to the mental health and well-being of the school as a whole. We will compare this to data from other schools where the pilot isn't taking place to see if we can show the pilot is what is making the change. We will do this in collaboration with a Masters student from the school of Psychology who will be supervised by one of our stakeholders who is a Professor at the university.

## When?


## Comments

We still need to agree on what will be included in the modules, who will be in charge of creating the modules, and how many external experts we will need to help with the different topics.

A risk for managing this phase is that there is quite a short time-line, as ideally the modules would begin in September when the students are back to school.

Another risk would be that the schools would rely too heavily on the involvement of SGD staff, when this wouldn't be possible for 4-5 schools, or for the long-term sustainability of the programme. Therefore, we are mitigating this risk by creating online modules that can be delivered by the teacher.

Please see Annex II p. 48-49 for the complete description of the idea canvas and the Experimentation Canvases.

### 9.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

The Mental Health Declaration for Europe, the Mental Health Action Plan for Europe and the European Pact for Mental Health and Wellbeing identify the empowerment of people with mental health problems and those who care for them as key priorities for the next decades.

In 2006, the Irish government published A Vision for Change: Report of the Expert Group on Mental Health Policy, an ambitious comprehensive mental health policy document which sought to consolidate and deepen moves towards community-based mental health care in Ireland. This came to the end of its 10-year term in 2016 and has been reviewed and updated.

However this policy does not hold up to international practice according to an international study 'Mapping and Understanding Exclusion in Europe' report, which has criticised Ireland for its lack of reform in the mental health sector stating that in Ireland, "Austerity measures and lack of clear policy guidance has resulted in very little progress and staff shortages and lack of funding imposes boundaries even for existing services".

- About the policy gaps and suggestions

*Table 63 SGD: About the policy gaps and suggestions*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| The transition between child and adult mental health services can be unorganised and traumatic. | There needs to be more joined-up thinking between the two services. A child cannot just be dropped suddenly or be refused care because they turned 18 – biologically nothing different has happened by turning this age. |
| The current policy allows young people aged 16 and over to to consent to surgical, medical or dental treatment without consent from their parents/guardian. However this doesn't apply to mental health treatment, they have to be 18. | Mental Health Reform are advocating for this change, a 16/17 year old should be able to decide their own care even when it comes to mental health treatment and policies should be revisited. |
| The Department of Education and the Department of Mental Health and Older People do not liaise with each other on mental health issues. | These departments need to communicate with each other, as there is a high level of mental health issues, especially for students at college. |
| There are no advocacy service for children and young people who are going through the mental health services: (recommendations of the 'Take my hand' report) | There is an advocacy service pilot in Galway, will be good to review this and see how it can be implemented across the country. |
| Policy is weak in the area of "dual diagnosis" – getting diagnosed with addiction and mental health issues | Addiction services need mental health services incorporated into them. |
| Mental health community is in consensus for "A Vision for Change" policy, but implementation is poor. | Need more funding to actually implement what was written and fund staff. |

- Future actions and suggestions for WP4 workshops

We hope as the pilot programme progresses to meet with the National Council for Curriculum and Assessment (NCCA) to discuss developing the programme as a new course, called a transition unit, as the NCCA is currently developing these and so could be interested in making our module part of the curriculum offered to schools.

## 9.4. Monitoring of the process

- Synthesis of the activities

*Table 64 SGD Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools*[5] | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | 1.1 Research | 2.3, 2.11, 2.12, 2.13, 3.1, 3.2, 3.5, 3.6, 3.8, 3.10, 3.12, 3.14, 3.15 | Bibliography Generated usable data - qualitative and quantitative | 2 | We didn't use any of the tools from Section 3. In the end they weren't very applicable to the method of research we were using e.g. field visit – we couldn't ethically do a field visit to a facility where there might be people suffering from mental health issues. |
| | 1.2 Preparation of engagement | 1.1, 1.2, 1.5, 1.14 | Relationships created between us and between the stakeholders | 94 | We didn't use these tools, instead we built the relationships with our stakeholders through one-to-one expert interviews or by running focus groups or educational workshops. |
| Phase 2 | 2.1 Visualise and Interpret data | 4.2, 4.4, 4.5, 4.7, 4.8, 4.9, 4.12, 4.16, 4.17, 4.18 | Clear visual representation of data, that highlights key areas of interest | 2 | We used the User Journey Map and Summary Framework (4.17 and 4.18), along with word clouds, mind maps, and design to create visual outputs from the Phase 1 research. |
| | 2.2 Reframe the problem | 4.11, 4.13, 4.19 | Showing results from data to extended group of stakeholders and narrowing down the options | 29 | We didn't use these tools, instead we presented the visual outputs and then a list of challenges that had been identified through the research Phase. The groups then created mind maps of the issues surrounding these challenges. |
| | 2.3 Frame opportunities | 5.1, 5.2, 5.3, 5.4 | Identify the important elements and listing what fit with the stakeholders' | 29 | We spent a lot of time creating "proto-personas" of the different stakeholders, but found that the groups didn't spend much time using them.<br><br>We created a list of all the challenges (as stated above) to present to the stakeholders. We didn't reframe the |

| | | | | | |
|---|---|---|---|---|---|
| | | | build the idea generation activity | | |
| Phase 3 | 3.1 Generate ideas | 5.5, 5.8, 5.9, 5.10 | Multiple ideas<br><br>Ownership of ideas | 29 | We used an Ideation Session and Role-Play Ideation (5.5 and 5.8), however found that the group didn't engage as much with the role playing as the young people had during our educational workshop weeks. |
| | 3.2 Refine and select ideas | 5.1, 5.3, 5.11, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.10 | Filter for best ideas<br><br>Move ideas forward | 29 (1st Idea Refining activities)<br><br>17 (Specific Idea Refining Session) | We used the Value Hypothesis (5.3) during our educational workshops, but not during our OPEN MIND group sessions. |
| | 3.3 Generate a concept | 5.4, 5.6, 5.7, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 6.1, 6.2, 6.9, 6.11, 6.13 | Strong concept that has evidence | 17 | We used the following tools:<br>Concept Prototype (5.12)<br>Concept Sketch (5.13)<br>Concept Evaluation (6.2) |
| Phase 4 | 4.1 Prototyping | 6.8, 6.9, 6.10, 7.1, 7.4, 7.7 | Produce basic and first iterations of a prototype | 12 | We will be using the Pilot Development and Testing (7.4) method by having a mid-term review with each of the pillow schools to assess how the programme is doing. |
| | 4.2 Assessing | 5.11, 5.12, 6.11, 6.13 | Prototype will be refined | 12 | We used the following tools during our prototyping session to plan out what the pilot would look like:<br>Solution Roadmap (6.11)<br>Synthesis Workshop (6.13) |
| | 4.3 Disseminating | 7.8, 7.9 | A visually attractive report of the prototype | 12 | We used the following tools during our prototyping session to plan out what the pilot would look like:<br>Vision Statement (7.8)<br>Innovation Brief (7.9) |

*Table 65 SGD Stakeholder engagement*

| Type of Stakeholders | Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|---|
| | | Co-producing | Co-designing | Consulted | Informed | |
| Young People | in Secondary School | ☒ | ☒ | ☒ | ☒ | No changes |
| | out of school | ☒ | ☒ | ☒ | ☒ | No changes |
| Teachers /Educators from Secondary Education | | ☐ | ☐ | ☒ | ☒ | Unfortunately we weren't able to involved teachers in the OPEN MIND Ideation/Refining/Prototyping sessions, due to teachers not being available during the day when the sessions were held. |
| Mental Health Groups | Groups eg. Pieta House, Jigsaw, First Fortnight who work with young people with mental health challenges | ☒ | ☒ | ☒ | ☒ | Representatives from these groups were much more involved in the process than we expected and attended all the sessions, and one is one of our most engaged stakeholders. |
| Medical staff/clinicians | People who work directly in the mental health service and see young people with mental health problems and how the health system could be improved | ☒ | ☒ | ☒ | ☒ | Difficult to engage with as extremely busy, but did attend co-creation sessions. |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Researchers from Trinity working in mental health research: neuroscience, social science, psychology, and in other universities | Researchers in the area of neuroscience, or technology that could be used to treat mental health challenges | ☒ | ☒ | ☒ | ☒ | More involved than expected in the co-creation process |
| Policy Makers | Policy makers at variant levels, locally and nationally | ☐ | ☒ | ☐ | ☒ | As expected, lower attendance – they did attend one co-creation session and are being kept informed. |
| High-tech companies | Google, Facebook, etc | ☐ | ☒ | ☒ | ☐ | Not involved at all, unable to find someone available to meet during consulting process, and as the ideas chosen by the stakeholders didn't involve tech they weren't involved in later co-designing sessions. |
| Trinity College Dublin | Counselling service department, general faculty and admin staff working in this field | ☐ | ☒ | ☒ | ☒ | No changes |
| 'Technical /designer' professionals | Experts in tech and design, who can help implement a solution , (depending on the type of output that is planned) | ☒ | ☐ | ☐ | ☐ | As the prototype chosen is low tech, these stakeholders weren't needed for the process. |

# Traces

## Exploring

Algorithmic responsibility and intelligibility, User consent,
Evolution of professions (doctors, judges etc),
Automated decision systems (ADS)

### 10. **Traces's journey**

TRACES' challenge aims at addressing the issue of making algorithms intelligible by its users, allowing users to understand when their data is used and their profile calculated and what comes out of it.

We first set up modules as part of an exhibition dedicated to the science of choice, specifically how more and more automated decision processes using AI represents both threats and opportunities for our knowledge society. How it raises issues of ethics and social exclusion, reproduction of inequalities, new future uses (autonomous cars) of technology.

We organised events, aimed at raising awareness of the issue of algorithmic dissemination in everyday practices: in mobility issues (an ill-fated tribunal on autonomous cars), in social networks (Valentine's day special), regarding GPRD, with regards to legal issues, and responsibility… these events were at the same time public events, and occasion to share and collect the views, worries, enthusiasms of different stakeholders. They were used to frame the issue, and to engage further people in the co-construction journey. In fact, one of the topic TRACES will address in the journey is: how can we build synergies between co-construction event and public cultural events, capable of nourishing each other while respecting the differences in agenda, level of engagement etc. This is a major question seen the convergent evolution of both informal education and co-construction organisations.

## 10.1. TRACES's journey implementation

### 10.1.1. Phase 1: Analyzing the context

- Process and methodology

Traces journey began with the context analysis needed to set up modules of the exhibition "Under the influence: the science of choice" dedicated to the way algorithms and AI are more and more involved in our daily lives (for entertainment, for producing news, for decision making, for finding a partner etc).

In parallel to this, we started mapping out the stakeholder network and we identified 5 main categories of actors involved: policy makers, researchers, education, citizen rights, innovation. After researching and analysing their activities and areas of interest, we shortlisted and get in touch with them. Depending on their interest / availability, we set up interviews.

We organised also public events, inviting experts in a field to interact with an audience. The discussions were analysed and used as input to frame the issue of the co-construction journey. Participants were always invited to engage in the process if they wish. In total, 5 events related to the issue of algorithms in our everyday life and science were organised:

- 15th of January 2019 : World Café "Ethical issues in science practices" with Alexei Grinbaum, researcher in Science and ethics
- 22th of January 2019 : Conference " Health, algorithms and responsibility" with Claire Mathieu, researcher in computer science and mathematics, CNRS
- 14th of February 2019 : Moving debate "Love and choices"
- 4th of April 2019 : Ill fated tribunal "Artificial intelligence"
- 23rd May 2019 : GDPR Night

- Main outputs and results

We developed ways of raising awareness of choices made with automated decision systems to a non-captive audience: the ill-fated tribunals allowed people to go beyond their "zone of confort" by playing with argumentations in a quite theatrical way and having fun in the process. They all came out of these experiences knowing more about issues raised by these technologies dissemination in society and to invent potential uses, both representing a threat or an opportunity.

There were more common methods used in cultural events / science dissemination events:

world cafes, conferences and moving debates involving experts in the field.


*Figure 10 Overview of the exhibit events*

| *Table 66 Synthesis of Traces* | Algorithmic responsibility and intelligibility<br>User consent<br>Evolution of professions (doctors, judges etc)<br>Automated decision systems (ADS) |
|---|---|
| Needs | Need of greater awareness on the presence of ADS in our daily life, greater understanding of their caracteristics, governance, main link with the model of society that we are developing. |
| Key evidences | Growing scientific literature<br>Legislation in definition<br>Spectacular raise in the media attention since the beginning of the project.<br>Strong demands of engagement (not only information) from audiences. |
| Main policy context elements | European law are being received in national law<br>Science policy agenda strongly focusing on data<br>Interest in linking scientific achievements and social impacts. |

### 10.1.2. Phase 2: Reframing the problem

- Process and methodology

The main output we created was the stakeholder's map with the tool Kumu (see Annex II p. 52), which allows to navigate through our key actors and link to our desk research we organised on the subject (most organisation or key actors having produced material on the subject, presentations, talks in conferences, white papers…). It allows to browse through resources and key institutions / actors / projects involved.

It also allows to identify links where the same stakeholder identified in a group (ex research) is also identified in another one (ex innovation).

- Main outputs and results

The main practical results were:

A clearer framing of the issue, built by listening to experts, interested audiences, and the interactions among them (those interaction being the key parameter of the following phases)

A clear definition of 5 stakeholder categories to be involved: education, research, innovation, policy making and citizen rights association.

A literature review more solid than at the beginning of the journey.

*Table 67 Traces key stakeholders*

| Main Stakeholders | Missions | Main interests in SISCODE's pilot |
|---|---|---|
| S1: L'arbre des connaissances | Association founded by researchers to promote dialogue between producers of science and society | *"Working together and discovering the others actors of the area that we can build something together with us but with different perspective is rewarding."* |
| S2 : Laboratoire de Recherche en Informatique | The research topics of the laboratory cover a broad spectrum of software-based computing and include both fundamental and applied aspects (ex: algorithms, databases, programming…) | *"We are always looking for new methodologies that allow us to better understand the questions we ask ourselves and as researcher, this kind of format allows it".* |
| S3 : Fondation Internet Nouvelle Generation | A reference think tank on digital transformations | Partnerships |
| S4 : Université PSL / DIMs Ile de France | Involved in PRAIRIE, a new center dedicated to research in AI | The PSL university can be interested in being associated with the pilot; DIMs researchers are dedicated to the subject determined by Ile de France region policy makers |
| S5 : Activists of Civil society / hackers = AlgoTransparency | eBastille and Algotransparency<br>Its an NGO whose aim is to inform citizens on the impact of algorithms which biaise what information we get online. They did some experimentation during US elections in 2016 then during presidential elections in 2017. | |

*Table 68 : Challenge Synthesis*

| | |
|---|---|
| What was the former challenge? | How to explore the issue of ADS with different actors and build together a way to trigger awareness of this issue among the general public? |
| Synthetic formulation of the reframed challenge. | How to organise interactions between research, education, civic right and policy making in order to identify ways to raise awareness of algorithmic decision making within general cultural activities ? |

### 10.1.3. Phase 3: Envision alternatives

- Process and methodology

Based on phase 1 results, we have organized an Open Lab Day, a professional afternoon meeting dealing with the issue of automated decisions using algorithms and AI through a multi-stakeholders dialogue bringing together actors from the world of education, scientific research, public citizen and policy makers.

The afternoon was aimed at a professionally concerned public and gathered 12 people among which, in addition to the invited stakeholders, a chemistry teacher, a science communicator, an exhibition developer from Universciences first museum of sciences in France, a researcher from Inra/Ifris and other citizens.

We had planned 3 mini workshops, corresponding to the three area of investigation (research, education, and right protection) following a common methodology in 3 steps of 15 minutes each: first discussing one case study, then widening the horizons by populating a chart with similar experiences brought in by the participants, and eventually find crossed perspectives of the case (namely how one area can be useful to another).

Participations of the 3 main speakers to the discussion as well as the diversity of the participants were key to the success of the afternoon.

The workshop continued through the evening, as a public debate was organized on "the future of choice in the era of AI".

We have synthesized the exploration with a mapping of the others actors (*see example in the Annex p. 51*) that have been mentioned and those who should have been present to enrich the exploration (companies, start-ups from the world of innovation and industry, sociologists, users, insurances which assesses the risk), and a mapping of approaches that promotes awareness of issues related to decision support algorithms. Eventually explored the different possibilities than can be prototyped together with a co-construction process that would be useful for everyone:

"**L'Arbre des connaissances**" has developed a game for young audiences called "play to debate" to demystify and deconstruct imaginative representations of AI and make them question this issue. During the WP, attendees expressed their interest to use this game for other purposes: very useful for organizations such as the FING, who are interested in consultation and citizen participation and are looking for tools of this kind; others attendees believe that setting the game in a place where the impact on users is high (companies etc) will help to better understand the processes related to AI, and some even want to use it as a team building tool.

Researcher from **LRI** has extended the field of research about AI with an artistic point of view, displaying artworks and artists' projects. Those represent stakeholders that allowed a de-compartmentalization of the area. The **FING** has established retro-engineering systems and transparency "symetria" between calculators and calculated (that is to say being able for people who provide data to use those themselves) as a starting point for reflections, providing high level inputs to the discussion useful for further development of the co-construction journey.

This phase is ongoing at the moment of delivery submission.

The activities carried out in the previous phases allowed to frame 3 potential focus for the prototyping phase.

The definition of which of the three will be actually developed is going to be taken in September. The elements determining the choices are more related to concrete opportunities (possibility of artist engagement, opportunities of testing in front of an audience) than to needs and desires of stakeholders. Co-construction will therefore be focused on stakeholder able to determine the feasibility of the project.

- Main outputs and results

Several options arose from previous phases, and were analyzed in terms of feasibility, potential for co-construction, potential for

1) Prototyping a devise reversing the issue, thus providing new insight on how to develop a general culture about ADS: this would consist in developing educational or cultural products not *about* AI, but *for* AI. By making artificial intelligences the target group, new understanding of our relationship with them are expected to emerge. The prototype of the emerging product could be in itself a mediation tool (not because it will evolve into a final product, but because it challenges and thus enrich the evolution of other final products developed independently).
2) Organize 3-4 art-science workshops on segmented issues related to decision making assisted by algorithms, to produce an exhibition of prototypes exploring the issues.

3) In a more classical co-construction approach, involve a group of high-school students in developing a scenario for a science presentation (*animation scientifique*) treating the issue, prototype it, deliver it in front of an audience, iterate.

*The three options mentioned above are the main output of this ongoing phase. The table synthesizes the ideas that emerged collectively through the ideation events and assesses their relevance for the project.*

*Table 69 Traces - Ideas*

| Ideas | Specific interest/ target | Type of innovation | Qualitative assessment (coherence, feasibility, originality, engagement, shared value)<br>+ opportunities - | |
|---|---|---|---|---|
| Algorithms for decisions as a target for educational or cultural products | See human-AI interactions under a new light; engage artists and speculative designers; | A prototype of an educational or culture event (e.g., a science presentation or a theatre play) targeting artificial intelligences, tested in real situations. | Novel and disruptive<br>Fully in line with the issue framed in previous phases<br>Capable of engaging diverse stakeholders<br>Media friendly<br>Deep investigation from a sociological point of view | Feasibility to be proven<br><br>No guarantee on the solidity of the outcome<br><br>Vocation to remain at prototype stage (or possibly art-work)<br><br>Most probably not reproductible |
| Art-science based communicat ion devices | Widening the existing vision on educational devices | Produce several prototypes and test them in real context | Widening current visions<br>Feasible<br>Engaging diverse stakeholders | No guarantees on the output |
| Traditional co-construction path to educational devices | Equipping the cultural sector with demonstrato rs on how to treat the topic of ADS in culture | A scenario for an interactive workshop targeting general public, prototyped and tested | Traditional co-construction<br>Engagement of young people and scientists easier<br>Feasible<br>Testable in existing settings | Not innovative in the co-construction format<br><br>Engagement of professionals and creatives less challenging<br><br>Little learning on more innovative approaches |
| Exhibition | General public | An exhibition on the science of choice | Highly appreciated topic<br>Excellent tool for stakeholder engagement<br>Actually, used in the first step of the co-construction journey | Too large a product to be used as prototype<br><br>Excellent for first stage or to welcome products from other ideas, not as idea in itself. |
| Labialization of ADS | End users of ADS | A system of labelling to keep citizen informed on who makes the choice | Interesting and socially relevant | Already at an advanced stage of development by very legitimate and competent stakeholders.<br>Discarded. |
| Pedagogical kit | Young people, teachers | A “toolbox” for treating ADS in informal learning settings. | Traditional and well-known process of co-construction<br>Feasible | Already existing in many format (useless to invent a new one)<br>Difficult to make it a moving and reactive device.<br>Discarded. |

## 10.2. The selected idea and future steps

*NOTE: At this stage of the journey, we still have 3 option under scrutiny. We present here only one of them, which is the less obvious, potentially more innovative one.*

| *Name of the Lab's solution* |
| --- |
| *ADS as a target of educational / cultural activities (one of 3 potential paths)* |

# What?

Most existing approaches see the ADS either as a subject of research (the "text"), understanding, or as a tool (the "tools"). We want to test them as "target" (spectators) of educational or cultural products. For example, what would a theatre play, or an informal learning show look like if the audiences where artificial intelligences?

# Why?

The social need addressed is raising the general awareness about the presence of artificial devices helping us in daily or complex choices.

The proposed idea would have an impact in raising the interest of policy makers, and all relevant stakeholders. Being at a cutting age provocation, it would probably not be able to engage directly the general audience.

# How?

**Activities**

Stage 1: reframing. One or two open workshops with artists, designers, scientists, exhibitions fan.
Stage 2: actual prototyping of 2 3 ideas
Stage 3: semi-public performance with feedback
Stage 4: refinement of prototype

**Main stakeholders and responsibilities:** Artistes, designers, and scientists already involved in phase 3. A few interested and engaged visitors. A large group of visitor for the interactive and feedback performance.

**Budget:**

Difficult to estimate at this stage.

# When?

Phase 4 has not started yet.

We reduced to 3 the options under explorations, the actual choice will be made in September 2019.

The 3 choices have equal interest in terms of stakeholder engagement, co-construction process, etc… We clearly ranked them in terms of their originality/innovation and feasibility: choice will be made taking into account these two variables.

*Please see Annex II p. 53-54 for the complete description of the idea canvas and the Experimentation Canvases.*

## 10.3. Policy Making in the implementation of the co-creation journey

- Getting to know better the local political context.

As we are at the crossroad of Research and Policies ( European, national, regional, and at the scope of Paris policies), we are getting to identify better the policy agendas of various people, organisations and programs (like PRAIRIE, a research institute involving GAFA actors and people from research, PSL University)

- Engagement with policy makers

The Ile de France Region, through the vice president for research, is supporting the project and declared itself curious about the results. They were supposed to be present at the Open lab day but the head of research and scientific culture had to cancel at the last moment. It is clear that a mid-management civil servant needs to be engaged, in order not to have cancellations.

Some activities will take place in a city funded venue, in other to stimulate the participation of city officers.

- About the policy gaps and suggestions

*Table 70 Traces: About the policy gaps and suggestions:*

| Identified Gaps | Recommendations and suggestions |
|---|---|
| Involving high level officers is possible in theory (they declared their interest and support), more difficult in practice (they cancelled their participation at the last moment) | Ensure in advance the replacement. |
| Policies exist and are very advanced but also very new. Critical dissemination into the general culture and wider audiences is still weak. | Ensure that the prototyping phase of the journey focuses on product offering and learning opportunity for policy makers about social impacts and are accessible to a wide audience. |

## 10.4. Monitoring of the process

- Synthesis of the activities

*Table 71 Traces Evolution of activities between 3.1 and 3.2.*

| | Effective Activity | Tools | Output | Nb | Comments ( any changes D3.1 ?) |
|---|---|---|---|---|---|
| Phase 1 | 1.1 Prepare research<br>1.2 Data gathering<br>1.3 Synthetize | Desk research<br>Interviews with researchers<br>Public events debates,<br>Ill-fated tribunals,<br>world cafes..) | Broad view on the ethical issues, the fields of human life impacted by the dissemination of ADS (legal enforcement, mobility, relationships, in market economy, in relationship with behavioural science | 91 | |
| Phase 2 | 2.1 Visualize and interpret data<br>2.2 reframe problem<br>2.3 frame opportunities | Idea Matrix | Humans input are – against the usual imagination of people – deeply needed to make AI work<br>Art / science practices allows us to understand differently how AI may function and algorithms' potential<br>We need a clear definition of AI with the term "intelligence' subject to criticism | 32 | |
| Phase 3 (on going) | 3.1 Ideation<br>3.2 Selection<br>3.3 Refinement | Idea selection | Ideas in discussion with the internal team and broader network | 15 | |

*Table 72 Traces Stakeholder engagement table*

| Type of Stakeholders | Stakeholders | Level of Engagement | | | | Comments of the effective participation and relevance ( Any changes since D3.1?) |
|---|---|---|---|---|---|---|
| | | Co-producing | Co-designing | Consulted | Informed | |
| Innovation Labs | FING | ☒ | ☒ | ☒ | ☒ | FING is interested in collaborating in Traces' challenge. It has now a long record / experimentations in "disruptive and open innovation" and specifically addressing the challenge of lack of transparency of algorithms. It has defined through a 3 years long project some guidelines on tackling the issue |

| | | | | | | |
|---|---|---|---|---|---|---|
| | My Data Global | | ☒ | ☒ | ☒ | We participated in professional events of this Hub around data protection and new challenges and opportunities arising with this issue. It allowed us to become part of a big international network (physical and online via Slack tool..) |
| | Dataveyes | | | ☒ | ☒ | In terms of project and effective visualization tools, they have a big capacity (they developed a program for Universcience exhibition on online games) but it's a business |
| Research | Baptiste Caramiaux (LRI) | ☒ | ☒ | ☒ | ☒ | Baptiste Caramiaux research team is involved in human machine mechanisms and learning processes. He introduced us to various artists using algorithms and technology in a way which allows us to become more and more conscious of the link between humans and technology as partners. He helped write a white paper on AI and creative industries.<br>He is a very interesting asset in art/science projects, should we use option |
| | DIM Rfsi: Réseau francilien en sciences informatiques | | ☒ | ☒ | ☒ | They are involved in the region Ile de France collaborative research program whose mission is to foster research and innovation in a defined subject, which have an impact on society. They are invited to take part in Researcher's night taking place in September at ESPGG |
| | DIM Mathinnov' | | ☒ | ☒ | ☒ | This program aims at developing research around new jobs in mathematics emerging from new technologies and innovation. They are invited to take part in Researcher's night taking place in September at ESPGG |
| Civil society | HackerzVoice | ☒ | | ☒ | ☒ | Are interested in experimentations trying to hack into systems, more software than hardware. But in a disruptive approach. Will be important to bring the DIY "if you don't break it you don't own it" approach |
| | AlgoTransparency | | | | ☒ | Introduced by la FING to us as potential partners needed to defend user's rights and civil society against the free dissemination of data uses against people's consent |
| | eBastille | | ☒ | ☒ | ☒ | Took part in the GDPR night, and are taking part in citizen legal defense actions |
| Education | L'Arbre des connaissances | ☒ | ☒ | ☒ | ☒ | Took part in the co-creation journey with presenting their Debate game on AI |

# III- Lessons learned and feedback arising from the first steps of the co-creation journey

This section presents the lessons learned from the 3 first steps of co-creation journey and gives some perspectives for the next tasks and activities.

## 1. From planning to practices

The following paragraph is a synthetic analysis of the ongoing action research in each Lab, as a moment of reflexivity on their journey.

As anticipated in the previous analysis (see D1.2 and D3.1), the richness of the co-creation process is in living it and experiencing the design and engagement process. Partners, whatever their level of experience are engaged in a new adventure that are transforming their perspective on co-creation and ways of working through design practices. Three insights will be discussed in this paragraph as they are emerging from both the qualitative and quantitative data reported in this deliverable (and the continuous exchange with the 10 labs):

- The SISCODE experimentation is enhancing the co-creation capacity at both individual and organisational levels in the 10 labs through an intense immersion into practice and peer-learning processes.
- As Labs take part in the process, this gives rise to some relevant feedback about the design approach concerning both the use of design tools and the development of soft management skills, going beyond instrumental approaches and realising the importance of systemic and complex project management skills.
- The most important activity of Labs in SISCODE Experimentation has been in the engagement of different ecosystems of stakeholders and communities. Important feedback and tips are shared by the different Labs with a special focus on public engagement.

### 1.1.Co-creation know-how - capacity building

*From individual to organisation learning*

The learnings about the co-creation process, techniques, tools and methods took shape in a heterogeneous way in-between labs. From the first workshop organised in each lab with the support team (POLIMI; CUBE, IAAC) between December 2018 and January 2019 to the implementation and testing of methods in the reality by conducting phases 1, 2 and 3, labs are gathering experience in practice and transform theoretical knowledge into know-hows, at both individual and organisational level. This impact is more noticeable with Labs who experience such approaches for the first time.

At the individual level, managing such experiment is challenging and comes with an intent to adopt new practices, leading changes in local context. Marina from PA4ALL explained that *"co-creating can facilitate scientific research by providing precise directions and insights on a specific topic from an individual or organisation who is already involved in it" and that "lack of experiences does not impose as a threat*". From Science Gallery Dublin side, Joanna and Grace, who precise that they "*neither had experience in co-creation or design thinking before the SISCODE project*" ensure that they "*have therefore both learned a huge amount about the overall process, techniques, how to facilitate co-creation and what true co-creation is (as opposed to it being tokenistic* - practice of making only a perfunctory or symbolic effort to be inclusive to members of minority groups*)."*

Individuals are the main sources of changes in the organisation. The dissemination of knowledge just starts to be translated and appropriated by other members of the team and of the extended ecosystems. For newbies, new practices can be disseminated in fast way due to lab's curiosity, agility

and small-scale environment. For instance, Joanna and Grace *explain that "they have already disseminated their learnings to some of the internal SGD team, and will use their new skills to teach the co-design and ideation phases of an undergrad course that SGD teaches called Idea Translation Lab as the previous lecturer has now finished at SGD*". Even they add that the *" learnings from the SISCODE co-creation journey are now beginning to influence how future programming for education and exhibitions will be carried out."* In the organisations with experience, it comes with the test of new applications and discussions about the specificities of the co-design process of SISCODE in ongoing practices.

On an organisational level, Labs value the potential of co-creation as a way to "bring synergy, better organisational structure and deep engagement of the actors, from different level of administration" and therefore it could influence policies at different systemic level (internal, city, region and even country level)

### *Peer-learning and management*

The different efforts to connect labs between each other and disseminate design tools and methods through a toolbox, collective physical and online meetings as well as regular monitoring tools allow to establish a stable and frequent system of contacts between labs themselves and endeavour the interaction between labs and the support partners and other WP leaders. Labs particularly enjoyed to discover regularly the work of others and use them as a source of inspiration for their own journey and questioning. They are learning to know each other and to become enough agile to start contacts on specific topics so to receive advices in a horizontal way. The interactions with network referents are more regular, considered as "coach" and advisors in the journey. A feedback that could be nuanced by the fact that the quantity of work in WP3 is noticed as highly important and that the distance between labs could remain important in such processes where organisations are running after time to develop their actions.

Despoina from THESS-AHALL synthesized that "*SISCODE partners provided valuable feedback for the reframing of the challenge in the entire duration of the three first phases of the journey, sharing their previous experience and know-how, especially regarding the systematic engagement of different types of stakeholders and how to make value for them.*" She specifies that *"DDC's support was crucial regarding the approach of policymakers (in-person discussion after the workshop in Milan), while POLIMI, as responsible for the Living Labs, and IAAC, as WP leader, and gave some very useful recommendations on the pivoting of the initial idea and its adjustment to the shorter-scale needs and objectives of the project".* Finally, she concludes that "*the interaction with the SISCODE partners provided some new ideas and interesting insights for the challenge, which had not been previously taken into account."*

## 1.2. Feedback on Design Approach

The co-creation journeys allows to highlight elements of discussion about the use of design tools and the development of soft management skills for co-creation.

### *Tools and co-design workshops*

Thanks to the flexibility of the SISCODE co-creation process including a customisation of tools and methods according to the local context, an important diversity of practices has been observed during the effective lab's journey (see *Table 3*) and relevant feedback on design practices could be highlighted:

From Cube, Anja and Gene comments that "*the work within the SISCODE project confirmed that the methodologies we used in the Cube design labs over the last 3,5 year give a firm base for co-creation and co-design with the different stakeholders and partners in the projects".* They follow saying that "*it gives [them] the assurance that design thinking is a good method to find relevant and feasible solutions for (societal) issues*". Carla, from Polifactory, shared that "*Visualization is very useful both for the team and for stakeholders involved*".

One comment from Milena and Marion from Fab Lab Barcelona in line with the importance given to local context in the overall approach is that even pre-selected tools need to be adapted and customised according to the people, the place and ambition of the activities. They think that the capacity of the facilitators/organisers fit more with people when they are making the effort of "re-creating"/ hybridizing tools for a specific use and context. They comment that "*In practice, it was really useful to list and review the ongoing methods present in existing toolkits to both learn and be inspired. But {they] think that workshops and tools need to be customised and sometimes redesigned for a better use/utility*".

By testing tools in the reality it can happen that they can work or not according to the local context where they are used and adjustments are made constantly as local knowledge is developped. Labs describe that it happened that tools were too specific or non-adapted to the public, or perceived as too complex and this was requiring to change the way in which workshops were initially designed. The good use of tools highly depends on the motivation of people and the skills of the facilitators.

Co-design is not just about selecting the more suitable tool, it is about building collective moments. An important side of co-creation in SISCODE are co-design workshops. They are about planning, organising, anticipating and maintaining interests. Specific recommendations were developed for how to conduct workshop in SISCODE in the exchange meeting between all the labs organised in Milan (February 2019), raising the importance of what happens "before", "during" and "after". Labs particularly highlighted that being flexible but anticipating different scenarios according to the number of groups, the number of people by group, the character of people, the number of facilitators are crucial actions so to avoid non-controllable situations and being able to build relevant outputs from the workshop. For instance, a tip from Carla, Polifactory is to "*ask to your target to answer specific tasks", because the extreme freedom in "creative" activities might be difficult for people who are not used to it.*

### *From situated events to long-term co-creation processes: the importance of Soft Management*

The lab's journey is a pretty long co-creation process. This enhance the importance of soft management as labs are running their experiments under uncertainty, time dependencies, facing complex ecosystems and societal challenges. Here it is important to highlight that even if our effort to monitor and document the journeys is resulting into a linear description of the all phases the labs went through, the effective and real process is messier, iterative and nonlinear as it looks like. While Carla from Polifatory underlines that co-design is an (extremely) iterative process, Gonçalo from Ciência Viva explicits this clearly: "*Even if we knew that co-creation is not a linear process, we are now much more alert to how messy it really is. We've learned to seize all occasions for gathering information and exchanging ideas, regardless of the phases of the journey, and to use data that should belong to one phase as resources for other phases (for instance, we looked at solutions that people offered right from the start as clues to analyse the problem and the context); but also to kill our darlings, that is, to get rid of ideas that we were attached to*".

In the SISCODE co-creation process, the dialogic between planning and acting is more present than ever: Marion from Fab Lab Barcelona comments that "*Planning in advance the all process in advance (journey 3.1) with details in term of activities and tools was not in the ongoing practices of the team project that were used to "make" and then reflect… [*that this was] *a change of practice [*that*] was pretty useful and support the diversity of task and methods used during the process.* For her, *"this global approach has permitted to increase the level of knowledge about co-creation tools",* but she alerts that *"The risks are generally to "see too big" and close the perceived freedom and thus locking the creative process*". *However, when planning is a step of design and plans are intermediary objects of design moving and being re-defined all along, the activity become powerful*."

Moreover, time was perceived as the main constraint to deal with, in different senses. Gonçalo (Ciência Viva) talks about different time perspective: "*time needed for preparing and doing research clashes with the faster rhythms of other independent projects of [the] organisation (and this can be difficult to understand by colleagues and superiors not involved in SISCODE); finding suitable times to meet and gather stakeholders who are themselves time pressed; time available for workshops that always seems too short for development of ideas and too long for keeping participants available*. Dealing with time pressures is a key aspect to consider in the overall process, a soft skill to take into account in a context where is it important to "*Take [your] time*:", creating an environment where people are "*pleased to dedicate time to work".*

## 1.3. Engagement through co-creation

The co-creation process is highly dependent on the way to engage, develop and sustain the "*ecosystems of stakeholders*", "*the local community*", "*and the partners of the project*". In this paragraph, general tips and feedback are shared in one table (*see Table 74*) on what is and how to "cooperate" within local network completed by a specific focus on public engagement – how and what are the difficulties that are facing labs to connect and engage with policy makers.

*Table 73: About Cooperation…*

| Engagement activity | Tip | Direct feedback - examples |
|---|---|---|
| Stakeholders identification | List who and how to engage under all types of stakeholders<br>Extend the network with "forgotten stakeholders" | *"The engagement plan with identification of stakeholders in the early stage of the project has allowed to guide and enlarge the spectrum of potentialities and help to think/build network. Getting in touch with the diversity of stakeholders in different events has helped to open possibilities as well as find specific opportunities for the project."* |
| Facilitation and change management | Think in terms of mutual advantages when engaging with your stakeholders | *"One crucial finding we experienced is the need for reciprocity of participation. It was noticed that without a regular external participation of the team in local event/collective/network, the project would not have engaged people in that way and could not be sustained. There is hope for co-construction only if stakeholders use a logic of "gift", without creating too much expectations from one-direction side".* |
| | Develop positive attitudes to build from (complex past) experiences<br>---<br>Create "neutral" position – friendly platform for discussion | *"Resistance to participate in a co-creation journey is sometimes due to experiences from past projects, misunderstandings, feelings of not being heard, frustration about spent time without the anticipated results, to name a few. These are just some examples that can play a major role in the (un)willingness to participate of different stakeholders. As mentioned before if the project doesn't fit in the priorities of the stakeholders it is impossible to get a positive result and an effective participation. Skills in the field of "change management" are needed. Important for the labs is to create a friendly platform for discussions in order to encourage the participants to speak and confront point of views".* |
| Context-dependencies | Societal challenges | *"Time, modes and engagement processes have to be differ according to the focus of co-creation and depend very much on the tackled issues. For example [Polifactori]had to spend time in developing a high level of trust both with the president of the association and the caregivers since the topic is very delicate and[they] could not risk to expose them to wrong messages or useless tasks. [Moreover]some topics might require longer processes of development according for example to legal, bureaucratic and professional constraints."* |
| | Create bridges between local projects for symbiotic cities/organisation | *"In order to involve inhabitants in the process it is necessary to organize meeting in their environment. According to the co-creation culture of places, the approach differs. Leading an experiment does not prevent to be part of others – Combine instead of add and compete."* |
| Open Innovation | Questioning the potential and ongoing limits of "opening" research design and production | In the case of Healthcare and for specific context, [Polifactory] mentions that *the Open Innovation approach might be limited especially for business stakeholders.* How to find new strategies/models that give open access while supporting the exploitation of results and maintain the assets of companies. Is it possible? |
| Anticipation of what next and sustainability | Explore simultaneously several ideas / strategies beyond SISCODE | *"A design thinking approach starts from human needs and ambitions but remains open to several alternative future possibilities.*<br>*During the process of the first 3 phases we have learned that a co-creation project is accumulating many ideas and spawn new ideas and projects. One result which have been conceptually developed as part of our co-creation journey could be discussed in other contexts and might become an exploitation opportunity for embedding solutions and scalability strategy after SISCODE. All is not about the final prototypes but in the interactions that create synergies, potential projects, more indirectly."* |

A specific set of insights have been elicited with respect to policy makers engagement.

In the following, the diverse strategies to engage policy makers in the SISCODE labs are synthetized and discussed with respect to 4 main issues: (1) the general feelings from labs, (2) the importance of time management; (3) the difference of reachability between civil servants and civil advisors, (4) the necessity to avoid impossible situations and overcome paradox injunctions.

**Different ways of to engage policy makers.** In the following table, a summary of the description of Lab's engagement is presented in a short and synthetic way.

*Table 74 Tips of "Engagement" from Labs*

| |
|---|
| o Identify potential policy makers |
| o Build upon existing/past collaborations |
| o Connect to understand and map the context<br>o (Interviews – participation to events) |
| o Do not expect too much from the beginning… Be concrete and relevant. Collaborations or effective community work building needs to be done before raising too much expectations from policy makers. |
| o Build in coherence with ongoing action plans, building key connections to increase legitimacy, discuss to understand the good frame and real potential for collaboration |
| o Inform and disseminate |
| o Use forms to elicit expectations or organise open consultations |
| o Connect with different scales (from district, city, sectorial, regional, national, EU policy maker) |
| o It is crucial to have policy makers and stakeholders on board who have a positive attitude to co-creation and citizen participation. If this is not the case skills in the field of "change management" are needed. |

The case of KTP, is original as they anticipated a real partnership with the region before the beginning of the journey. For them, the output of the journey will be a policy programme and the policy maker will be the direct beneficiaries of the journey results. In the early stage, they organised in collaboration with region an open consultation that is experienced as the beginning of their journey, and where they feed this opportunity to extend the network engaged and increase the qualitative feedback from local stakeholders. By doing so, the mode of governance and engagement was discussed and re-arranged so to fit with innovative practices and classic public procedures.

(1) **Emotional temperature.** Engaging policy makers, changing ongoing practices, is a real challenge perceived by labs. Comments explicit some emotions, satisfaction and frustration experienced in the ongoing process. Vocabularies – expressions as "Hard to reach policy makers", "pretty rough", "found the most difficult" reflect this difficulty. Labs talked about "legitimacy, doubts", they attested that in a number of situations, where they contacted policy makers, "*they either didn't hear back from policy makers that they reached out to, or they told them that they were too busy to engage with the project*".

On the contrary, there is a pretty strong positive feeling when, as in the case of KTP, policy makers become actively engaged saying that « *the biggest success of the co-creation process was that every participant got involved in the workshops and had the feeling of real influence on the policy making process.* »

(2) **Times: Planning in advance.** The specificity of time for dealing with policy makers is mentioned by several labs. For Anja and Gene, "*It is very important to take the possible time*

*spending and availability of the different stakeholders into account during the planning of the process and procedure. The agenda of councilors and civil servants are difficult to influence and planning in their availability needs a long period before the actual participation process."* They followed saying that *"Politicians usually act within a period of 4 years (elections) and that this can influence their motivation of participating in de co-creation journey with citizens and other stakeholders*." With other words, Carla from Polifactory reminds that "*engaging policy makers and other stakeholders takes time and cannot be planned, since long-term commitment is needed, which also requires building trust and the freedom to experiment*".

**(3) Civil servants vs city counsellors.** Different discussions during our meetings have pointed out the diversity of the policy makers depending on the context and on the local decision-making processes. This knowledge is crucial to identify the right level of governance to deal with and who, among the policy makers to engage. More specifically, policy makers could be multiple and it could time-consuming to engage with the "wrong" person. Anja from Cube, noted particularly that "*in these processes we have experienced that the cooperation between politicians (city councillors) and civil servants are a delicate ground. Sometimes the policy makers want to work together but the civil servants are afraid of extra work load, sceptical about the outcome or just not convinced that co-creation is the way to go*." Asger from Underbroen completed that it is "*engaging municipal officers is easier [*and that a strategy could be to] *continue to inform policy makers, and to engage municipal officers more directly*.

**(4) Initiating… but waiting for results.** Stine and Asger from Underbroen highlights that "*In relation to the co-creation journey [they] have learned how difficult it is to engage policy makers in projects and initiatives before having measurable and tangible results".* Anja from Cube add that *"Working with policy makers can sometimes create a difficult situation in the sense that they want to have evidence/proof for a project but the proof can only be found in executing the project. This is called a " Catch 22 situation" which means an impossible situation, "an unsolvable situation." For example: suppose a new medicine has been invented. Safety can only be tested properly if it is tested on test subjects. But the government prohibits the use of the drug in test subjects because it has not yet been tested on humans. That is then an example of a catch 22."*

## 2. Conclusions and perspectives: What Next?

Now that they have reinforced their knowledge about co-design, engage local stakeholders in a first round of workshop, and identify a solution to develop for the next year, SISCODE Labs partners will have to move from co-design to co-production, a delicate passage that will be supported by different steps. Building upon recent feedback and discussions, 3 specific actions will be proposed in the following months: (1) developing prototype of the envisioned solution for each challenge and experiment with them in order to create common knowledge and feed the knowledge repository about prototyping, (2) enhancing the support of the local policy-makers, (3) ensuring that pilots results are disseminated during the co-production phase in a transversal way at different levels of governance showing the benefits of co-creation for the real implementation of the RRI dimensions.

### 2.1. What's about prototyping?

The main hypothesis of the SISCODE project is that prototypes could correspond to the bridges that will allow co-creation process to go from ideation to implementation and vice-versa in an iterative way. (*see Figure 11*)

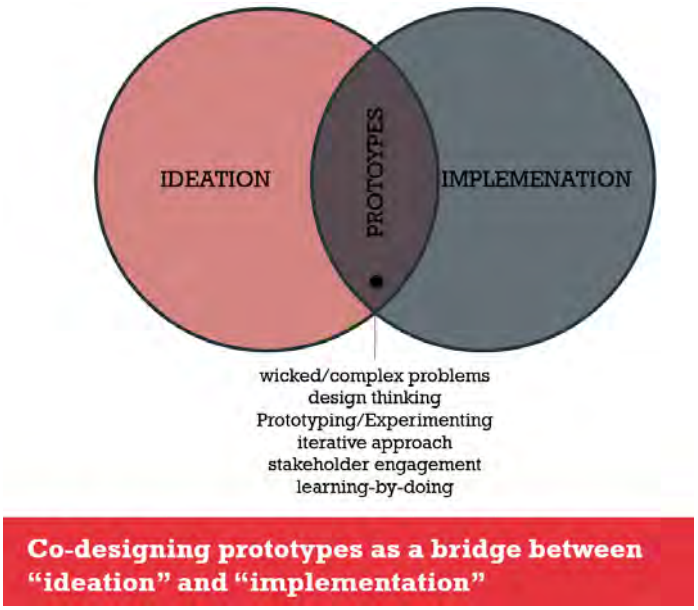



*Figure 11 Role of prototypes*

A collective understanding of the notion of prototypes is needed among the partners taking into account the diversity of solutions (from product, service, system, exhibition) proposed by the labs. Following this discussion, a dedicated toolkit will be built and shared with the Labs from each network through a personalized meeting that will occur in between August and end of September. The exercise will be interesting as the specificity of each type of Labs will be enhanced in the toolbox, represent thus, the diversity of points of views and practices within each network and local context. First insights about prototypes will be shared at the Brussels meeting in October, where a second Lab exchange meeting is going to take place in parallel with the consortium meeting. Finally, the prototyping activity will feed the knowledge repository of SISCODE.

## 2.2. How to involve policy makers?

The prototypes are also perceived as object of interaction for defining new forms of interactions in local context. The prototype are seen as a learning environment for policy makers to observe co-creation of the prototype among the actors of the ecosystem.

Due to the effective difficulties from several Labs to engage or maintain the contact with policy makers, an effort to reinforcing the interaction between Labs and policy makers will be proposed in collaboration with the partners of WP4. Individual calls, guidelines, co-construction of broader workshops are first steps that will ensure that Labs explore as far as possible the contact with relevant policy makers, so to help to sustain their projects.

### 2.3. How to reach and support RRI and citizen engagement?

RRI is going beyond public engagement and need to be supported and monitored in this specific project where a high importance is given to understand new models of co-creation needed for facing societal challenges.

Labs are learning from other WP work, and are regularly inviting to reflect on the evolution of their journey, understanding the complexity of their processes within ethical dimensions (open science, gender issues, citizen participation, and respects to SDG goals…) and ensuring the real-time dissemination of research and innovation results.

Additional efforts will be done to specify the role of each type of labs as RRI ambassadors, where a playground is under construction to experience new design practices in STI processes, connecting stakeholders to learn about and participate actively in sciences for societal challenges. This will be done through different actions as (1) the open days organised by labs (see deliverable D7.2), (2) the monitoring task (T3.5) where a logic framework about RRI and co-creation is being realized, and (3) by the diffusion of appropriate supports for the Labs and other project partners to be used during the journey. Related with WP7 – Communication, an effort need to be done to extract the key knowledge from the labs and design supports that are attractive and more accessible than ongoing deliverable.

## Annexes

### Annex I: Documents related to part I and III

### Annex II: Visual representations from each co-creation Labs

# D3.2 Annex I - Organisation

SISCODE

Planning, support and monitoring activities

p.1 Exchange moments between Labs: #1 Exchange Lab in Milan (February)
P.2 Exchange moments between Labs: #2 Blujean Calls
p.3 Formalisation of the support team
p.4 Overview of the dashboard for the Support team
p.5 Monitoring tools #1 : Spreadsheet
p.6 Monitoring tools #2 : Self-Assessment questionnaire
p.7 Kumu _ Challenge Mapping
p.8 Frameboard_original

# Milan – Co-creation / Learning

Agenda

Tuesday - 12.02 – Polifactory, Milan

GETTING TO KNOW EACH OTHER AND MAPPING SYNERGIES

12.00 - 13.00: Lunch at Polifactory
13.00 - 13.30: Introduction and insights from the first steps

13.30 – 17.00: Presentation and Q&A session by each lab (20mn by lab)

Fab Labs (13.30 – 14.30)
- Fab Lab Bcn
- Polifactory
- Underbroen

Living Labs (14.45 – 15.25)
- KTP
- PA4ALL
- THESS-AHAL

Science Museums (15.40 - 17.00)
- CIENCIA VIVA
- CUBE
- SCIENCE GALLERY
- TRACES

17.00 - 18.00: Identifying and Mapping the Synergies

Dinner

WEDNESDAY - 13.02 – Polifactory, Milan

MORNING SESSION: 9h00 - 12h

Introduction and Group Distribution (20')

GROUP 1: HEALTHCARE
THESS-AHAL,SDG, Polifactory, CUBE,TRACES
Facilitation: POLIMI + SPI + DDC

GROUP 2: ENVIRONMENT
UNDERBROEN, KTP, FAB LAB BCN, PA4ALL, CIENCIA VIVA
Facilitation: IAAC + ENoLL + DDC

EXCHANGE ABOUT AND CHALLENGE YOUR JOURNEY

ANALYSE THE CONTEXT 1'20
Role-Play With *Problem Definition* by THESS-AHALL

Role-Play With *Geographical Resource Mapping* by UNDERBROEN

REFRAME THE PROBLEM 1'20
Role-Play With *10 FRAMEBOARDS* by SGD

Role-Play With *Checking the Problem* by KTP

RESTITUTE AND REFLECT (20')

AFTERNOON SESSION: 13h00 - 17h

What's Next ? How to Interact? (20')

GROUP 1: RE-GENERATION
CIENCIA VIVA, POLIFACTORY, SGD, CUBE, FABLAB BCN
Facilitation: IAAC + SPI + DDC

GROUP 2: ICT AND SERVICES
PA4ALL, TRACES, THESS-AHAL, UNDERBROEN, KTP
Facilitation: POLIMI + ENoLL+ DDC

ENVISION ALTERNATIVES 2'00
Role-Play With *Idea Card and Idea Selection* by CIENCIA VIVA

Role-Play With *Idea Card and Idea Selection* by PA4ALL

RESTITUTE AND REFLECT (20')

16h00 - 17h00: FREE SESSION BETWEEN LABS

**Objective:** exchange about and challenge your journey, getting to know each other and mapping synergies. Co-creation workshop: learn by doing and peer-learning. .

**When/Where ?** 12/13.02.19 in Polifactory, Milan

**How?** Co-organised by IAAC, POLIMI and DDC. Facilitated by IAAC and other partners (SPI, ENOLL, CUBE, DDC), Creation of specific tools by IAAC (Customised Role-plays) - Played by Labs. See agenda.

6 ROLE-PLAYS WITH PERSONAS AND DESIGN TOOLS

DISCUSSIONS AND NETWORKING WITH SYNERGY CARDS

INTERACTIVE MAPPING

MAKE IT TANGIBLE BY WEAVING CONNEXIONS

First co-creation lab exchange workshop in Milan

**Exchange moments between Labs: #1 Exchange Lab in Milan (February)**

# Blujean Calls

**Objective:** A regular space for interactions between the support team members and the labs.

**Which frequency ?** Bi-weekly (until May), monthly (from June).

**How?** The WP lead partner waits for proposals/requirement from the lead partner, the support team and the labs, set up and diffuse a common agenda. The call is accessible via Blujean and lasts 1h /1h30 and follow the agenda. In each call, there is a dedicated moment for questions.

27.02 3pm-4pm
- Planning and support presentation/discussions
- Overview Labs: 3mn: 1 inspiration, 1 key moment, 1 difficulty

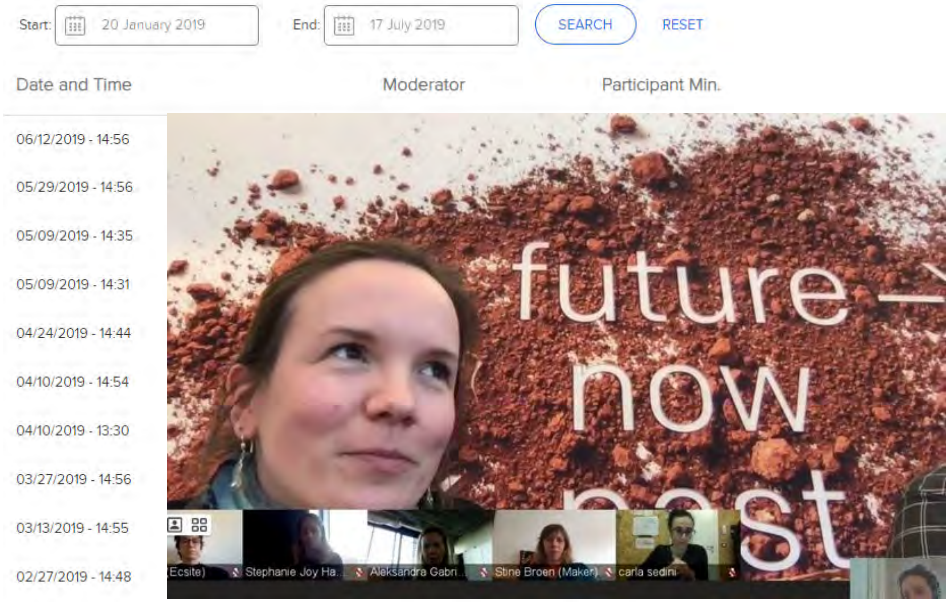
13.03 3pm-4pm
- Monitoring activities by Pamela and Marion
- SDG
- POLIFACTORY
- Q&A

27.03 3pm-4pm
- Open Days by Ecsite (Carmen)
- Underbroen
- TRACES
- Q&A

10.04 3pm-4pm
- Deliverable 3.2
- Cube
- Thess-All
- Q&A

24.04 3pm-4pm
- KTP
- PA4AL
- Q&A

09.05 3pm-4pm
- Policy and WP4 Feedback by Stephanie
- Fab Lab Bcn
- Ciencia Viva
- Q&A




**Schedule: Overview**

1) Deadlines: D3.2 - in end of july - Insights before 30th June. Deliverable plan coming soon

1) Calls: biweekly remote calls with WP3 partners / Co-creation Labs to discuss **WP3 as a whole.**
   - Presentation of Monitoring activity
   - Presentation of the open days
   - Discussions about the toolkit
   - Deliverable 3.2
   - A space for each lab to discuss its journey

1) Exchange lab Meeting: to be defined (Paris ?)

| WHO? | Description of the role and competences | Modes of interventions | Frequency / Times | Limits / Constraints/ Risks | Feedback to the support group |
|---|---|---|---|---|---|
| IAAC<br>marion@fablabbcn.org | Global Management<br>Fab Lab Referent Support<br>Redirection<br><br>Animation group Environment | BlueJean Calls<br>Fab Labs interactions<br>Individual Skype Call<br>Lab's exchange meeting<br>Feeding Base-Camp<br>Mails | Once every 2weeks<br>Next on the 14th March<br>On demand<br><br>Weekly | Max 3 individual calls/week<br><br>Autonomy of labs | Minutes<br>Monthly Calls<br>Mails |
| CUBE<br>Gene | Museums Referent Support<br>Redirection | Mail / Call / Physical meeting | | | |
| POLIMI<br>Pamela | Referent Monitoring<br>Redirection<br>Living Lab Support | Mail / Call / Physical meeting | On demand<br>According to task<br>Monitoring schedule | | Comment on the Dashboard |
| ENoLL<br>Ines | Living Labs Referent Support<br>Redirection | Emails, individual calls, lab's exchange meeting, joint organisation of co-creation workshops, Links with policy makers | ad-hoc (minimum: monthly) | | |
| DDC<br>Stephanie and Sarah | Policy Design support | Individual calls (Joanna / Despoina)<br>Link what Workshops | | | |
| ECSITE<br>Andrew and Carmen | Open Days and communication supports<br>Following the dissemination | Individual follow up<br>Occasional interventions | | | |
| SPI<br>Olga and Marilia | Sustainability Support | On demand<br>Occasional presentations<br>Observations | | Not a lot of time for WP3 | Need to centralise demands by IAAC who interacts with SPI |

## Formalisation of the support team

# Support DASHBOARD

**Objective:** Complete the mails / skype calls with a common file to keep update about partner activities

**Which frequency ?** Support partners are supposed to fill it all along their interaction with the Labs. We will ask them for updates regularly (each two months) and verify each six months.

**How?** This a google spreadsheet for all partners. A tutorial was sent by email.

| When (Date) | Who (Support Team) ? | Form of interactions (mails, calls, meeting) | Fab Lab Bcn | Polifactory | Underbroen | KTP | PA4AL | Thess-AHAL | Ciencia Viva | Cube | Science Gallery | Traces |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019-02-12 | All | Meeting | X | | | | | | | | | |
| 2019-02-12 | All | Meeting | | X | | | | | | | | |
| 2019-02-12 | All | Meeting | | | | X | | | | | | |
| 2019-02-12 | All | Meeting | | | | | X | | | | | |
| 2019-02-12 | All | Meeting | | | | | | X | | | | |
| 2019-02-12 | All | Meeting | | | | | | | X | | | |
| 2019-02-12 | All | Meeting | | | | | | | | X | | |
| 2019-02-12 | All | Meeting | | | | | | | | | X | |
| 2019-02-12 | All | Meeting | | | | | | | | | | X |
| 2019-02-27 | ENoLL | Skype chat | | | | X | | | | | | |
| 2019-02-27 | ENoLL | Online call | | | | | | X | | | | |
| 2019-02-27 | All | Blujean | X | | | | | | | | | |
| 2019-02-27 | All | Blujean | | X | | | | | | | | |
| 2019-02-27 | All | Blujean | | | X | | | | | | | |
| 2019-02-27 | All | Blujean | | | | X | | | | | | |
| 2019-02-27 | All | Blujean | | | | | X | | | | | |
| 2019-02-27 | All | Blujean | | | | | | X | | | | |
| 2019-02-27 | All | Blujean | | | | | | | X | | | |
| 2019-02-27 | All | Blujean | | | | | | | | X | | |
| 2019-02-27 | All | Blujean | | | | | | | | | X | |
| 03-01-2019 | Marion | Mails | | X | | | | | | | | |
| 03/04 | ENoLL | Email | | | | X | | | | | | |
| 03/04 | ENoLL | Email | | | | | X | | | | | |
| 03/04 | ENoLL | Email | | | | | | X | | | | |
| 2019-03-07 | ODC | Call | | | | | | | | | X | |
| 2019-03-13 | CUBE, MAC | Call | | | | | | | | | X | |
| 2019-03-13 | All | Blujean | | X | | | | | | | | |
| 2019-03-13 | All | Blujean | | | | | | | | | X | |
| 2019-03-21 | ODC | Skype | | | | | | X | | | | |
| 2019-03-25 | PoliMi | Email | | | | | X | | | | | |
| 2019-03-25 | ODC | Mails | X | | | | | | | | | |
| 2019-03-27 | All | Blujean | | | | | | | | | | X |
| 2019-03-27 | Isaac | Email | | | | | X | | | | | |
| 2019-03-27 | All | Blujean | | | X | | | | | | | |
| 2019-04-01 | PoliMi | Skype call | | | | | X | | | | | |

Global Support | Fab Lab Barcelona | Polifactory | Underbroen | KTP | PA4ALL | Thess-AHALL | CienciaViva | Cube | SGD | Traces | Ideas/Suggestions

**Overview of the dashboard for the Support team**

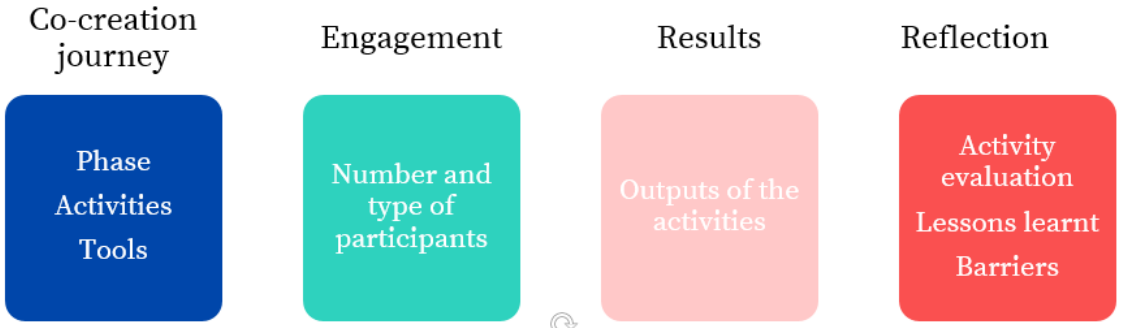
# Spreadsheet

The Spreadsheet tool has been designed from march/april.

**Objective of the tool**: Follow up the activities of each labs. Following the journey, 10 columns has been developed to described four aspects has been categorized, the activities, the engagement of stakeholders, the outputs and lesson learnt.

**Which frequency ?** Labs are supposed to fill it all along their journey. They start at the end of april. We will ask them for updates regularly (each month) and verify each six months.

**How?** This a google spreadsheet for each lab. A tutorial is proposed in basecamp.




| Phase | Activity (Refer to the 03.1 - The co-creation journey plan) | Start Date | Tool | Name the tools | Short description (max. 280 characters) | # Total (individuals) | Description about people / participants (if the case) | Results of activity / Outputs (max. 280 characters) | Comments on the activity (1.General evaluation of the ac Obstacles 3. Lessons learnt) |
|---|---|---|---|---|---|---|---|---|---|
| Analyse Context | 1.1 Desk Research | 2019/11/23 | Literature review | Journal's articles Google Scholar | Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Aenean commodo ligula eget dolor. Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat mas | 0 | | Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Aenean commodo ligula eget dolor. Aenean massa. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec quam felis, ultricies nec, pellentesque eu, pretium quis, sem. Nulla consequat mas | 1. Did the activity worked fluently? Did you get the data you<br>2. What are/were the obstacles? How did you / do you plan<br>3. What did you learnt from the activity that could be consic activities? |
| Analyse Context | 1.1 Circular economy context analysis | 2019/01/15 | Participant observation | | Event attendance to 4 Co-creation events about Education and Research in Coopolis, cooperativism and short-loop circuits, Nanotechnology for Energy, Open Ideo Challenge "Food Jam", Responsible consumption week events | 2 | The stakeholders marked with x were also in the activity but the event was not organized by a SISCODE partner. | Pictures, notes and content documents, that feed the presentation and statement for next steps | 1. New insights for workshops. New tools and approaches learning. Better understand of some challenge aspects like some projects in term of food waste, circularity in Bcn and<br>2. I have experienced on some frustrations about co-creatic a lack of qualitative outputs in some events, or some soft c of facilitators.<br>3.There was a strong diversity of practices. But all worksho a strong diversity of activity planned. Preparation phase an important than expected. The selection of participants and to keep them in the process is determinant. How to engage we invite them just for one event where we open the ideatic |
| Analyse Context | 1.1 Field Research | 2019/01/23 | Interviews | Unstructured Interview | Interviewed experts in the topic of air pollution | 2 | Two individuals from different civil society organisations, Organisation A and Organisation B | Notes and insights useful to update the Challenge; local context. | 1. The interviews were very enlightening because they gav about current research on the topic and new EU policies ar polution.<br>2. It was very difficult to reach the people from the organis agenda, but we had a big network that allowed us to reach<br>3. The first interview we had some ideas about the questior realized they had so many ideas to share so on the next int and a first initial question which guided the conversation. It order to give us a broader perspective instead of asking clc |

# Self-Assessment questionnaire

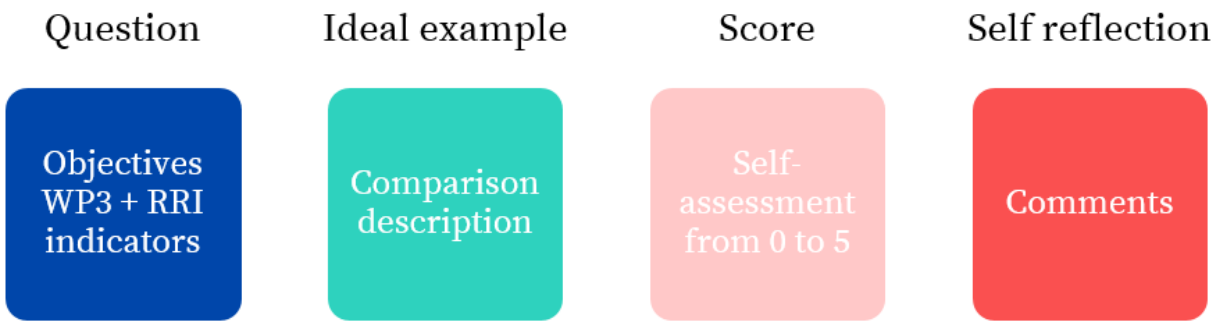
**The Self-Assessment questionnaire has been designed by Polimi after several rounds of discussion.**

**Objective of the tool**: Evaluate experiential learning, setting up a baseline and monitoring changes.

.

**Which frequency ?** Labs will fill it three times to assess their capacity Before, during (before phase 4) and after the Siscode journey.

**How?** Via survey monkey. 9 pages of form for 7 different topics, built with the ambition to let lab self-assess in both semi-qualitative (scoring) and qualitative ways (comments). (see below)




**Topics**

PAGE 2: Public engagement (PE1,PE2, 3b)

PAGE 3: Public engagement (3b, PE1)

PAGE 4: Citizen Science activities (SLSE 3)

PAGE 5: Address a relevant challenge (3c)

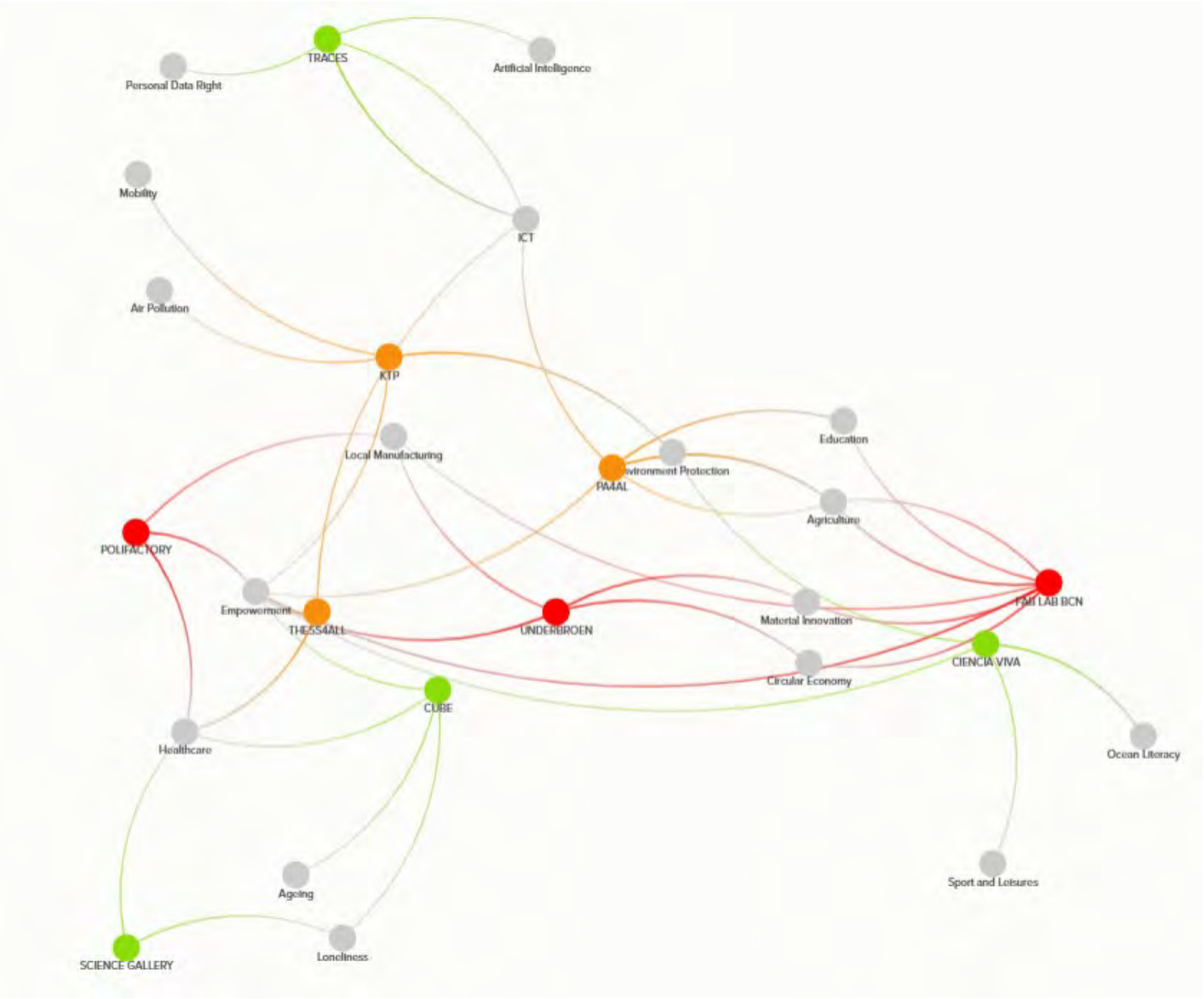
PAGE 6: Co-creation know-how and capacity building (3.1/3.3 PE2)

PAGE 7: Validate design methodologies (3.2)

PAGE 8: Dissemination (3.4, OA1, OA3)

PAGE 9: Creation of solutions and policies (3d)

# Topic interaction between labs




Using Kumu online software.

It illustrates the connexion between fab labs (red), living labs (orange), museums (green) concerning their challenges. (key words in grey)

https://kumu.io/missreal/labs-siscode#visualisation/classic

# Frame: name

## Solution

Visuals

## Description

## Value proposition

## Name

***Tagline***

## User (-s)

## Key problem

## Solution approach

## Alternative ideas

Original Frameboard Canvas from Design thinking – shared by Cube.

# D3.2 ANNEX II - VISUAL SYNTHESIS

SYSCODE

Discover the co-creation activities of each Lab in pictures and with design canvases.


What the annex contains? p 2-8

Pick your lab p 9-54

| | | | |
|---|---|---|---|
| FAB LAB BCN | p9 -13 | THESS-AHALL | p33-36 |
| POLIFACTORY | p14 -18 | CIENCÎA VIVA | p37-40 |
| UNDERBROEN | p19 -24 | CUBE | p41 -45 |
| KTP | p25 -28 | SCIENCE GALLERY DUBLIN | p46 -49 |
| PA4ALL | p29 -32 | TRACES | p50-54 |

# WHAT THE ANNEX CONTAINS?

For each lab, you will find visual information such as photos of workshops, tools, mapping as well as canvases defined as SISCODE synthesis tools that support them in representing ideas and planning the next phase.

**1**

**Sharing personal design and pictures**

**2**

**Representing ideas**

IDEA CARD

p. 3-4


FRAMEBOARDS

p. 5-6



EXPERIMENTATION CANVAS

p. 7-8

**3**

**Planning the next Phase**

# IDEA CARD

The idea card canvas was already presented in D3.1. The Idea Card canvas organizes in one page the idea that labs are developing: the challenge and needs they are addressing, the solution, what they might achieve and how they will accomplish this. It is an excellent tool to use when presenting the initial idea to stakeholders or future beneficiaries/customers to get a feel of what they are doing right and what they could improve. The tool can be completed individually or in groups. Users start the activity by defining their challenge and the specific needs that they are addressing. Next, they think about what it would look like if the challenge was solved. Once their challenge is framed, each lab can clarify its own idea, what it could achieve and how it could be accomplished.

# IDEA CARD CANVAS

## CHALLENGE
What challenges are you addressing?

## NEEDS
What are the needs ?

## IDEAL SOLUTION
If the problem was solved, what does it looks like ?

*Insert Text or Sketch*

## IDEA

## VALUES TO ACHIEVE

## HOW ?

**Comments**

The project has received funding from the European Union Horizon 2020
Research and innovation programme under the grant agreement n°788217

# FRAMEBOARD

The Frameboard canvas is a tool developed by Guido Stomff (2018) and used by Cube as a main tool in their design approach. A frameboard is a canvas/template to visualize and communicate the results of the exploration of one frame. A frame in this sense is a certain perspective on the problem/challenge. In the design methodology the exploration of at least 6 – 10 different frames is recommended to explore the problem. The template is used to then visualize these frames. These frameboards then help you to discuss the different frames, different views on the problem and different solution spaces. The frameboard is also relevant for describing the idea in a slightly different way than the idea cards. It gives more space to the sketch and visual drawing.
The original frameboard (see Annex I  p. 9) has been adapted with the SISCODE graphics.

Stompff, G. (2018). *Design Thinking. Radicaal veranderen in kleine stappen.* Amsterdam: Boom uitgevers.

# FRAMEBOARDS

DESCRIPTION

VALUE PROPOSITION

TARGER - USERS

KEY PROBLEM (s)

SOLUTION APPROACH

ALTERNATIVE IDEAS

Comments

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# EXPERIMENTATION CANVAS

The objective of this canvas is to describe the key aspects of how the solutions will be implemented in the phase 4 of the SISCODE pilots entitled "develop and prototype". It needed to be adapted for each type of solution retained by the partners and to integrate all key project management dimensions. The proposed canvas is a combination of the social innovation business model canvas (from SI-toolbox and already explained in the Siscode toolbox) and the canvas "design the experiment" from Peloton Camp. It was re-designed for the purpose of the project. The canvas permits to understand (1) the goals of the experiment, (2) the target group that will be involved as well as (3) the territory scale of application, (5) what prototype and materials will be produced, (5) the key activities and responsibilities for each actor and what they need to agree on, (6) the cost structure, (7) the timeline and a short-term plan of action and finally (8) the assessment framework.

https://www.demoshelsinki.fi/wp-content/uploads/2018/06/designing-the-experiment-canvas.pdf

# EXPERIMENTATION CANVAS

LAB's Name

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

## WHERE AND WHICH SCALE ?

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

## TARGET GROUP

## YOU NEED TO AGREE ON

## COSTS STRUCTURE
How will you expense the budget ?

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

## TIMELINE / MILESTONES

August 2019 _____ June 2020

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

## Comments

The project has received funding from the European Union Horizon 2020
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# SYSCODE

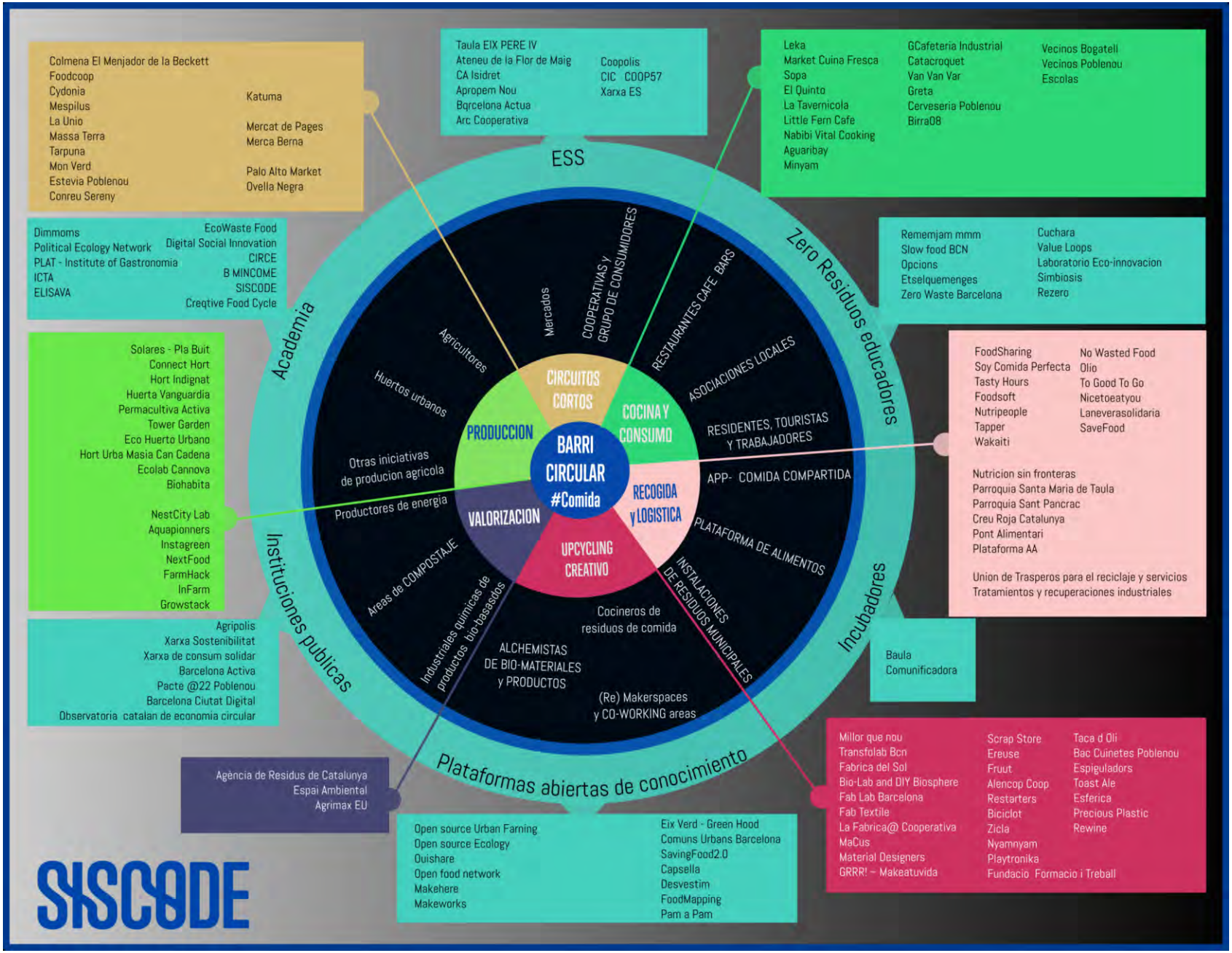
## Visual synthesis

Food systems, local production, circular economy practices, eco-innovative solutions, community synergy, bio-material innovation

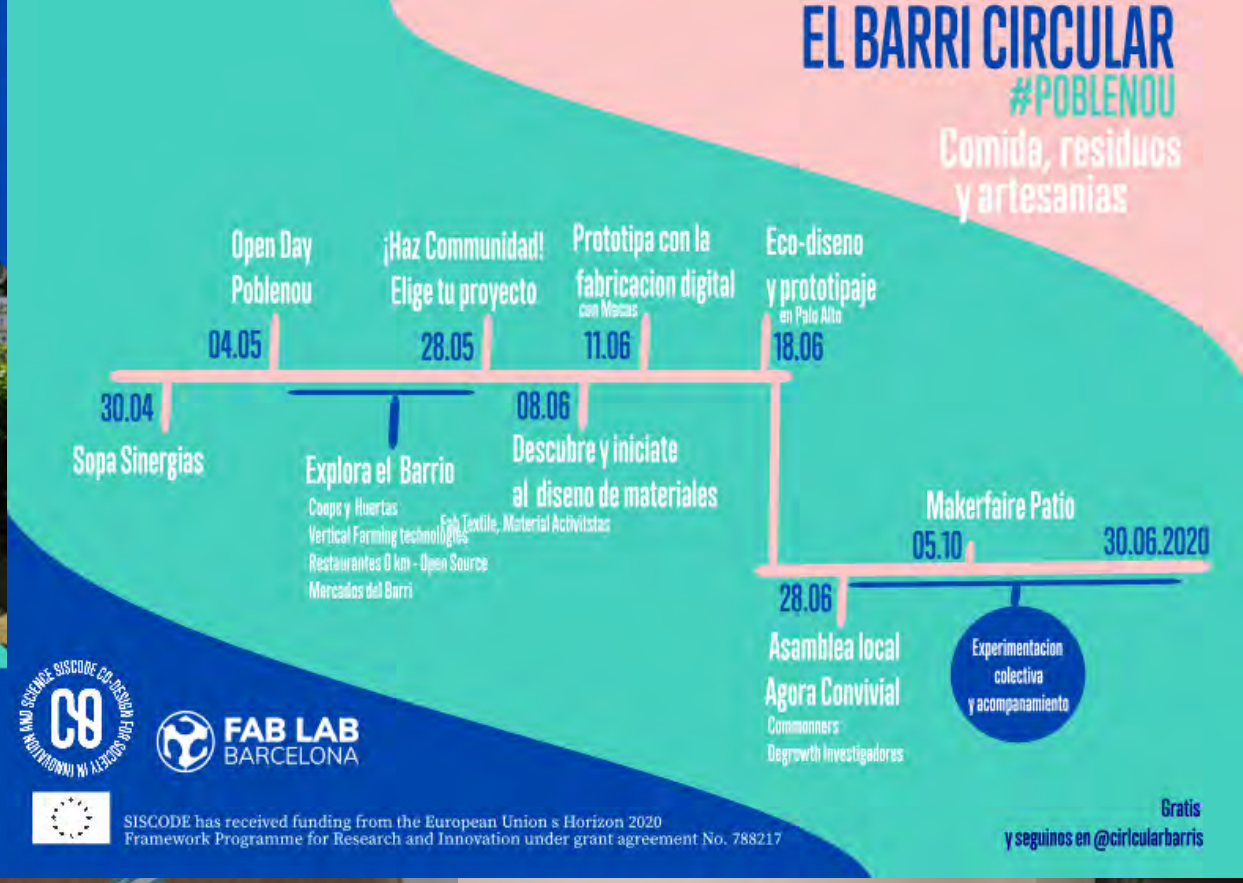
# FAB LAB BCN

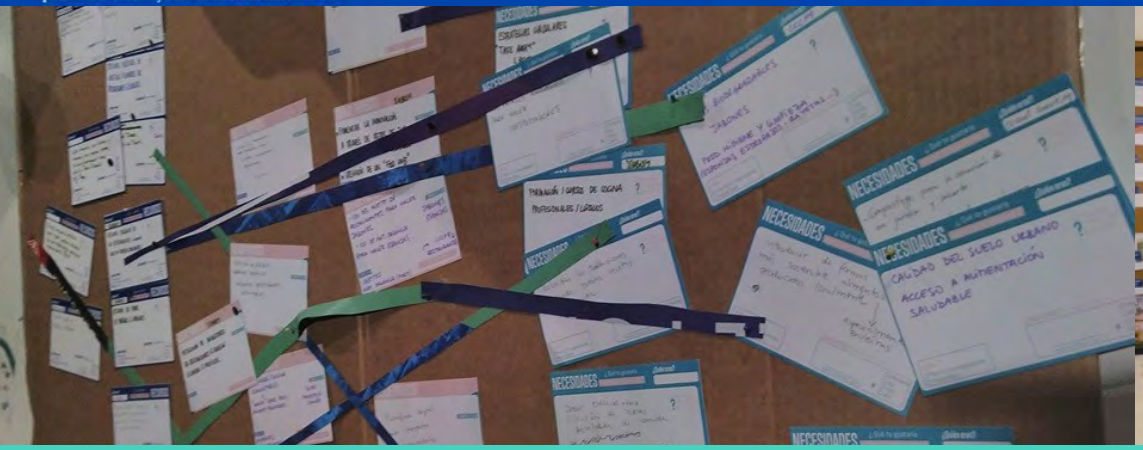
How to identify and stimulate new synergies among the local community in order to co-develop educational, logistic and environmental supports for better redistributing, upcycling and composting food locally

Symbiotic System for food surplus and bio waste valorisation at a neighbourhood scale




# Local Circular Food Stakeholder Mapping (Phase 1 output)



Overview of the events (flyer, program, synergy mapping, workshop)

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

Valorization of surplus food and biowaste at a neighbourhood scale through material innovation, composting technique and community kitchen.

## NEEDS

What are the needs ?

- Development of collection system logistics and bicycle cargo racks
- Partnership with places to make/ prepare biomaterials
- Data collection for further environmental assessment of the process

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?


## IDEA

To develop a system for improving the redistribution of food surplus and upcycling of food waste at a neighbourhood scale in terms of logistic and material innovation.

Development of:

- Bicycle cargo rack and trolley cart for materials transportation
- 3D printers for biomaterials
- Biomaterials exploration (production of bowls and possible bags to distribute compost)

## VALUES TO ACHIEVE

- High participation of local stakeholders, sthrengthening cooperation
- Knowledge about digital fabrication tools trhough community learning (peer to peer)
- Improve the circularity of food and its valuable waste within Poblenou
- Application of ecodesign during the exploration
- Development of a prototype model for circular economy at neighbourhood
- Provide insights to policy makers based on a real case
- Progressing towards, a circular economy at local level which foster innovation to prolong life cycle of materials

## HOW ?

- Engage local actors through communication channels and face-to-face invitation
- Formalize partnership with restaurants, associations, cooperatives and maker spaces
- Co-design and produce a bicycle cargo rack for food and materials collection and distribution
- Find a place to prepare biomaterials
- Partnership with makers
- Provide tools and services to support the pilot
- Collect data to further assessment
- Bank-time for volunteers

## Comments

The project has received funding from the European Union Horizon 2020 Research and innovation programme under the grant agreement n°788217

# EXPERIMENTATION CANVAS

Fab Lab Bcn

## GOALS FOR THE EXPERIMENT

What do you want to test ? Why ?

To engage stakeholder and co-develop a system for improve the redistribution of surplus food and upcycle food waste (biowaste) in terms of logistics and material innovation at neighbourhood scale

- To support a societal change and community empowerment for sustainable solutions and circular practices related to the local food ecosystem
- To allow local stakeholders to benefit from higher value materials to extend the quality, the durability and economic viability of their activities.

## MATERIAL / PROTOTYPES

What physical prototypes you will need to develop ?
Any material requirements?

- Bicycle cargo track (recycled wood, plastic and metal)
- For biomaterials: blender, alginate, recycled wood, silicon
- Container or sorting devices for biowaste collection
- ICT system for monitoring

Machines: Use o CNC, 3D printers, laser

## WHERE AND WHICH SCALE ?

Poblenou district in Barcelona – neighbourhood scale

## TARGET GROUP

- Students
- Makers
- Citizens
- Restaurants
- Urban gardens
- Policy makers

## YOU NEED TO AGREE ON

- Logistic sytem (Biciclot)
- Campaigns with restaurants to better separate the biowaste
- Sustainability strategies
- Data collection and type of analysis
- Time of explorations

## THE EXPERIMENT IS A SUCCESS WHEN ?

What criteria/value you would like to assess ?

- Forter innovation to prolong the life cycle of biomaterials
- Open design
- Implementing a protoype model that support a transition towards CE
- Achieving the collection of a high quality organic fraction
- Strenthening the cooperation and link between stakeholdes

## KEY ACTIVITIES AND RESPONSABILITIES

What kind of activities are required to the implementation of the plan?

- Stakeholder engagement → Communication
- Map possible spaces to use for experimentations
- Collaboration with designers and makers (bici cargo and digital fabrication tools)

## COSTS STRUCTURE

How will you expense the budget ?

RH: 2 part times + 1 intern
Materials: <15 000 for siscode – complementary funds (ddmp/foodshift)
It'll be distributed among materials, spaces (rent), communication, events, professionals (knowledgde transfer)

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Secondary → Published references, previous projects
Providing an internal database to share information of each experiment (collective feeedback)
Quantitative → Amount of materials used, people involved, energy spent, products generated
Qualitative → lifetime, flexibility of materials, resistance

## TIMELINE / MILESTONES

Need analysis and planning
Xp
Assessment
Booklet + Fabcitiy integration
Development / redesign of prototypes
Replications

August 2019 — June 2020

## TO DO LIST / NEXT STEPS

Give us a list of your key activities

- Set up a workflow for the exploration
- Officialize partnership with restaurants and provide them information and materials (containers) to separate materials
- Set up the activities (workshops, events, makerfaire)
- Prepare a communication plan for the new activities → new campaign
- Select the materials necessary for each exploration

## Comments

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SISCODE

Health & Wealth of young stroke survivors

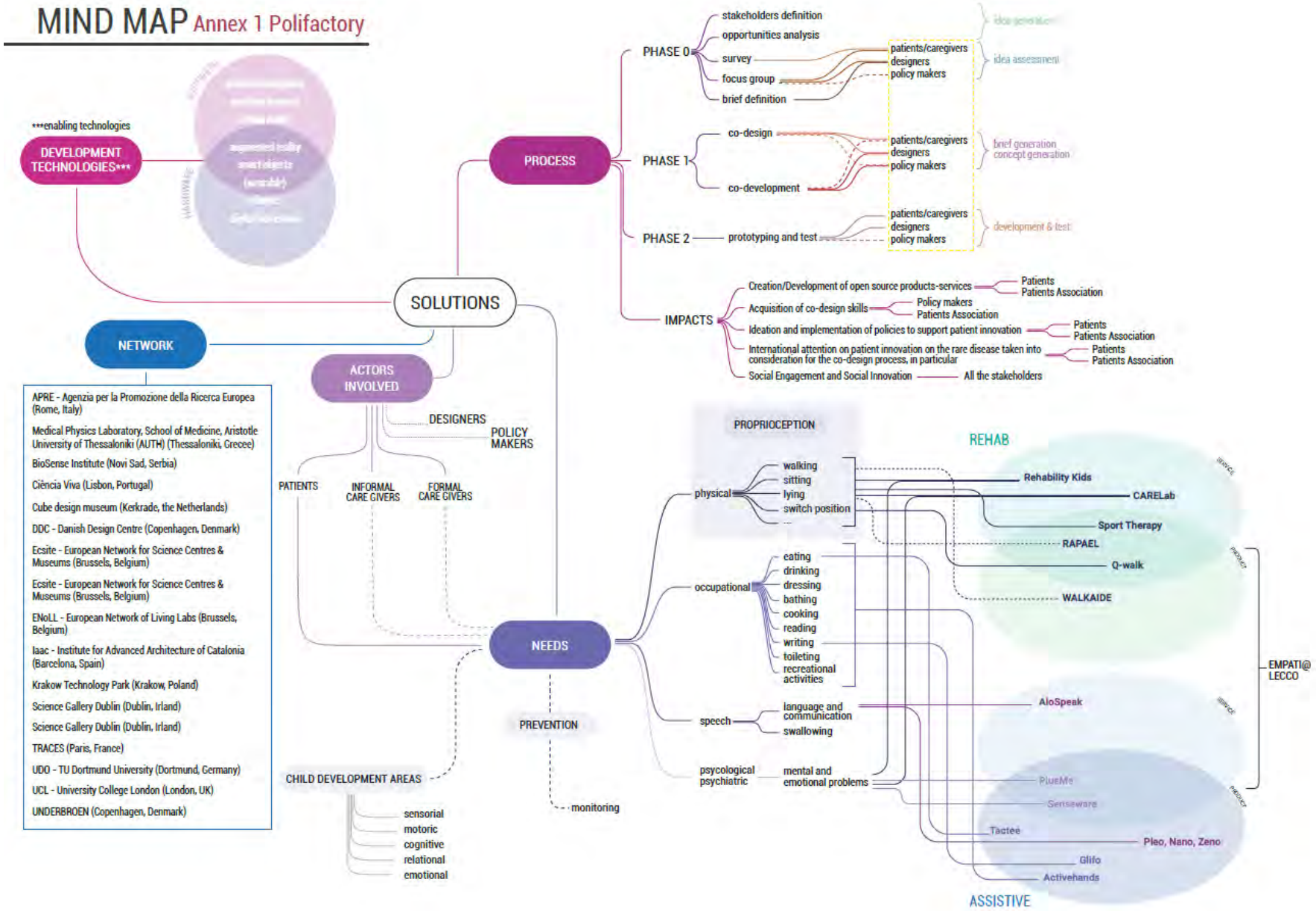
# Visual synthesis

POLIFACTORY

How to improve the movement of children with cerebral palsy thanks to sound-based innovative solutions?

BODYSOUND

# MIND MAP Annex 1 Polifactory




Mind Map of the Context Analysis

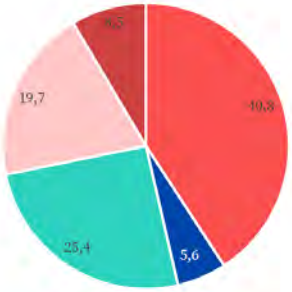

## 71 RESPONDENTS

87,3% 12,7%

60,6% 39,4%

AGE <3 3-5 6-11 12-18

18,3% 33,8% 38% 9,9%




- Perinatal stroke
- Pediatric stroke
- Asphyxiation/Anoxia
- Other cerebral damage at birth
- Other damage in pe age

**95,8%** Diminished motor and coordination capabilit
**50,7%** Difficulties to speak
**35,2%** Epilepsy

*Deficit*
**56,3%** harm
**52,1%** equilibrium
**42,3%** leg
**42,3%** both legs

*Aids*
**59,2%** leg/foot othos
**31%** wheelchair

*Difficult actions*

**66,2%** dress
**62%** run
**56,3%** grab
**52,1%** write draw
**50,7%** wash

**84,5%** **Rehabilitation** activities

**17,6%** **Leisure** activities
40% Theatre
33,3% Music

**50,7%** **Sport** activities
83,3% Swimming
13,9% Dance

### "yes" places

**90,1%** home
**67,6%** school
**56,3%** outside

*«Supposedly he feels safer at home and school. But in general, wherever the environment and*

### "no" places

**31%** cure/therapy places
**28,2%** freetime/leisure places
**16,9%** outside

→ Noise sentitiveness(31%)
→ Crowded places (28,2%)
cessible places (19,7%)

**100%** Wants to be updated about the project

## QUESTIONNAIRE | CO-DESIGN

**81,7%**
Has never participated in co-design activities

BODYSOUND
Co-create innovative solutions to improve the movement of children with cerebral palsy

**91,5%**
Would like to participate in the activities organized within BODYSOUND

# IDEA CARD CANVAS

POLIFACTORY

## CHALLENGE

What challenges are you addressing?

BODYSOUND. Co-create innovative solutions to improve the movement of children with cerebral palsy.

## NEEDS

What are the needs ?

Children (and caregivers): physical needs, such as walking, sitting, lying, etc. (the most common problem is a reduced movement and coordination capacity)

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?

*The possibility to create inclusive spaces and activities which are not directly connected to rehabilitation and therapy but can support them. The idea is that of exploit a playful activity to favor the movement.*

## IDEA

Bodysound is a system of motor stimulation of the limbs based on the transformation of movement into sound. Within a sensorized room, children can move (both following instructions or freestyle) and transform their movement into sounds (or melodies). The room is able to detect the child's movement and to send, through a wearable device, a haptic feedback to guide him/her in the "right" execution of the movement.
The room is able to detect the child's movement and to send, through a wearable device, a haptic feedback to guide him/her in the "right" execution of the movement.

## VALUES TO ACHIEVE

The solution exploits sound as a motivational and inclusive element; indeed, from one side it was thought for children affected by cerebral palsy, and therefore it will be based on a system of stimuli and exercises designed on their needs (e.g. bimanuality, mirroring of movement, etc.); from the other side this solution can be used also by children which do not have this kind of pathology. Indeed, having fun (and not be bored), be challenged in a positive way, encounter other people (in this case children) can have very positive effects on their mood and somehow on physical improvements as well.

## HOW ?

After the test, a series of technologies during the BODYSOUND lab journey, we will develop a first prototype that related the different elements of the system. In parallel we will try to test it to co-develop the children's user experience and validate the effectiveness of the chosen technology. At the same time, we will rely on the support of therapists to define the proper typologies of movements and the possibilities to customize the system based on the needs of different patients. We will develop a first version of the software that we will implement based on tests results.

## Comments

The project has received funding from the European Union Horizon 2020 Research and innovation programme under the grant agreement n°788217

# EXPERIMENTATION CANVAS

POLIFACTORY

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

We are going to experiment the whole children's user experience in order to understand their preference in terms of:

- environmental detection
- haptic device feedback
- movement guide
- generated sound
- technology
- typologies of movements

## TARGET GROUP

- Children with a diagnosis of cerebral palsy

## YOU NEED TO AGREE ON

- Children do not have to be in severe conditions, e.g. quadriplegia

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

Wearable object (e.g. bracelet)

ICT system (e.g. cameras, kinect, computer)

## WHERE AND WHICH SCALE ?

Milano

At the moment the solution will be tested at Politecnico di Milano

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Patients associations engagement and satisfaction
Open designs + learning
First quantitative data
Possibilities for further development

## COSTS STRUCTURE
How will you expense the budget ?

Software: 1000€
Hardware: 4000€
Space: 1000€
Development: 7000€ + sponsorship
Other costs: 2000€

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

- Patients and caregivers: co-testing activities, focus groups, diaries;
- Therapists: face to face meetings
- Policy makers: interviews/talks, workshop at the national level.

## TIMELINE / MILESTONES

- Prototyping milestones: october, march, june
- Test milestones: december, may, june

August 2019 — June 2020

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

- Strategic collection of the core resources (already started)
- develop a first prototype that relates the different elements of the system
- test it to co-develop the children's user experience and validate the effectiveness of the chosen technology
- engagement of therapists to define the proper typologies of movements and the possibilities to customize the system based on the needs of different patients.

## Comments

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# SISCODE

## Visual synthesis

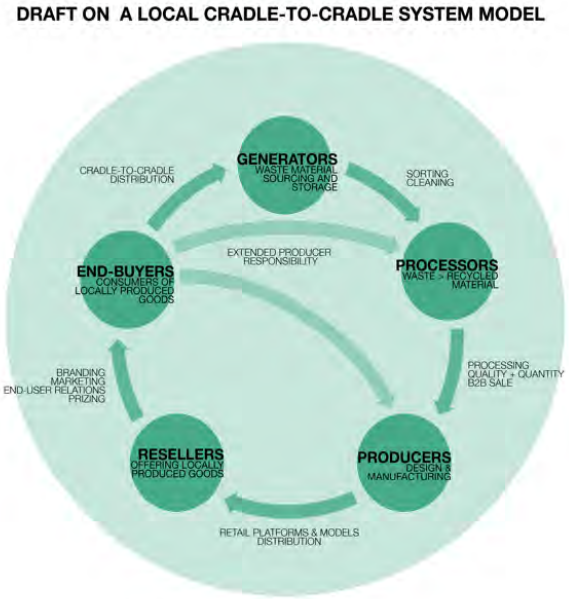
Circular Economy, Local Production, Circular material flows, plastic economy, systemic innovation, material innovation, recycle, reuse, small scale designers

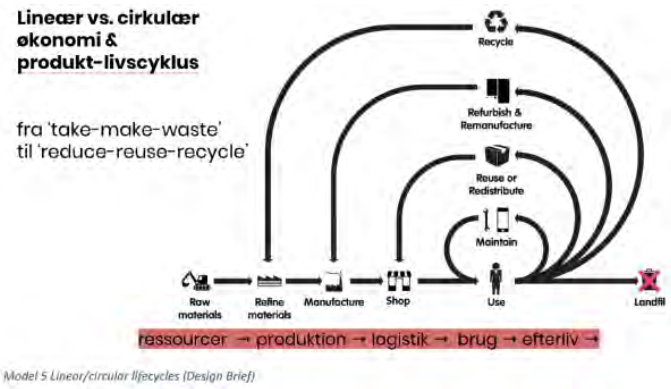
# UNDERBROEN

How can local micro entrepreneurs, SMEs, commercial resellers and citizens collaborate in a circular system plastic recycling production model in Copenhagen? What facilities, systems and workflows are needed for the recirculation of local materials?

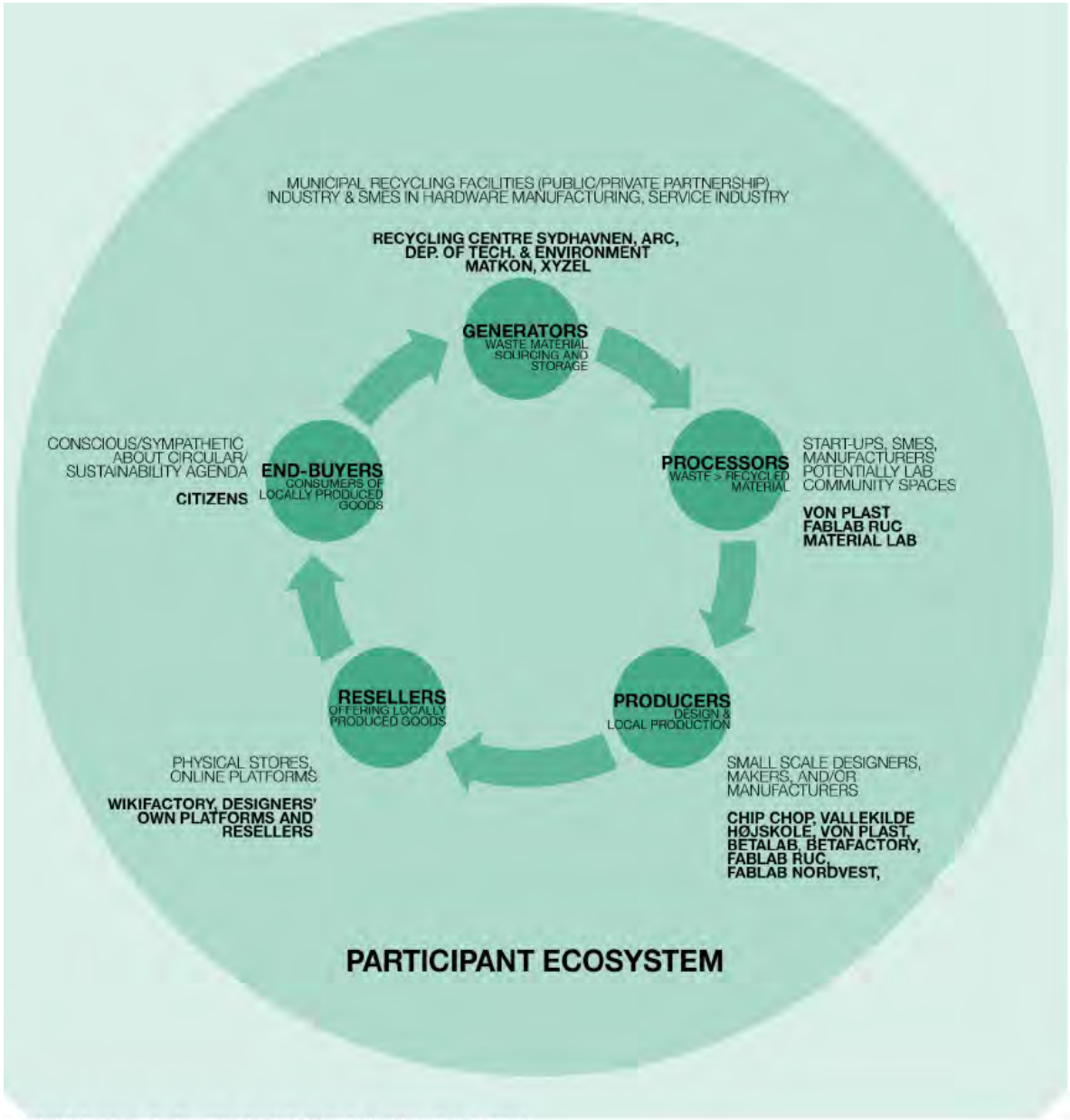
'Plastic In, Plastic Out' (PIPO)

" Circular system for local sourcing, recycling and production of sustainable plastic building materials and products."

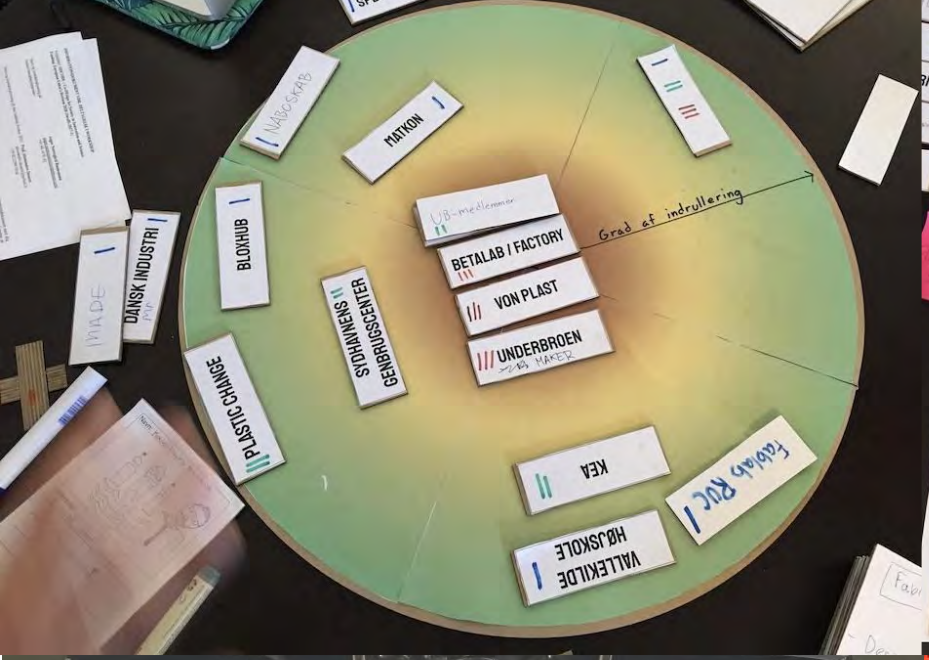


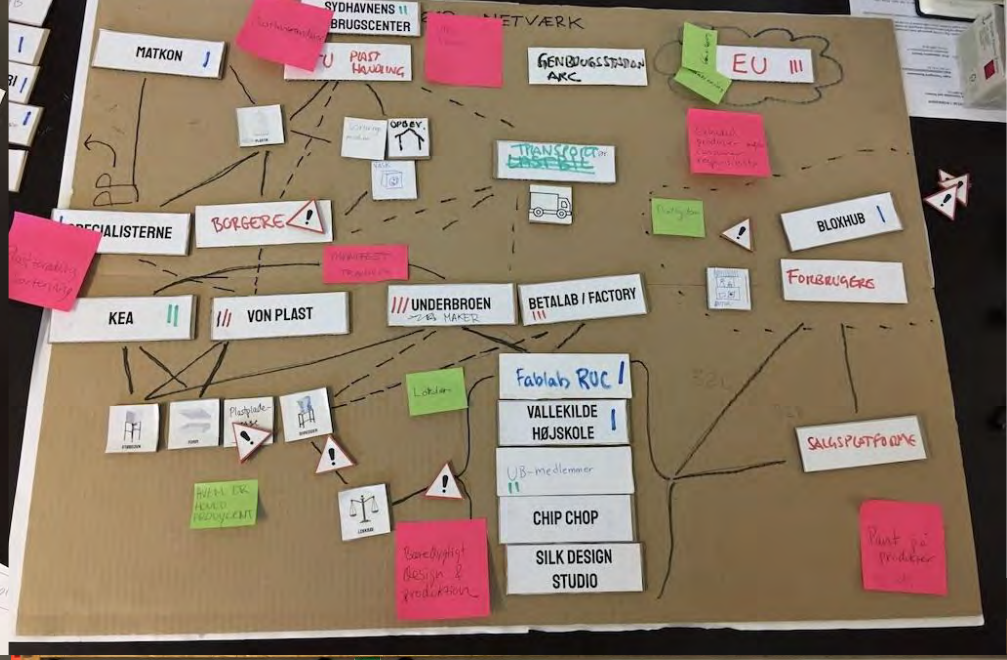



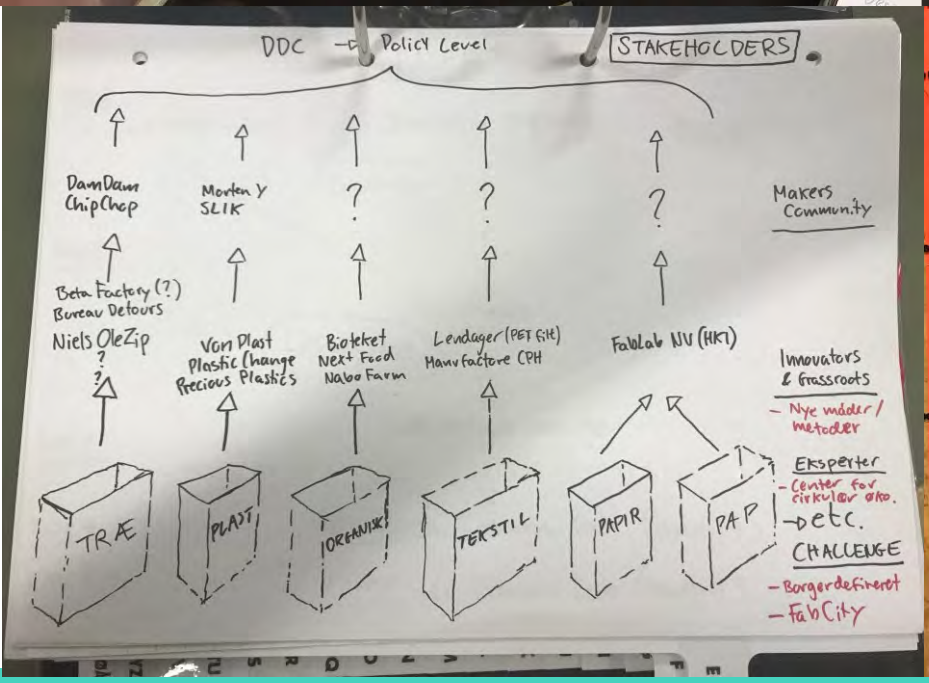

*Model 5 Lineor/circular lifecycles (Design Brief)*

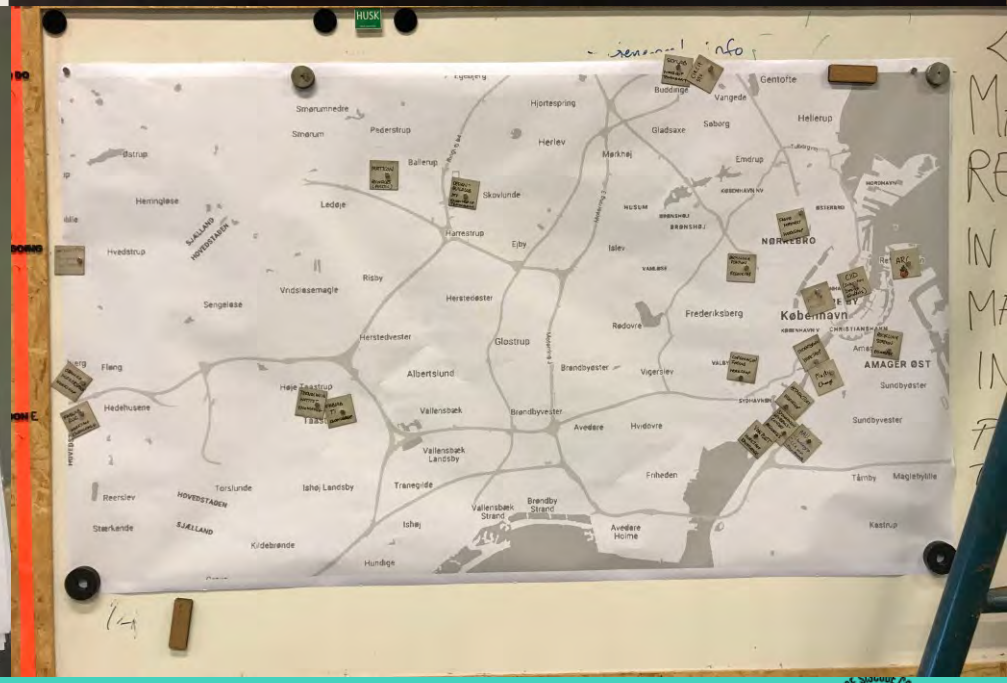



*Model 1 System draft with identified stakeholders (synthesis)*

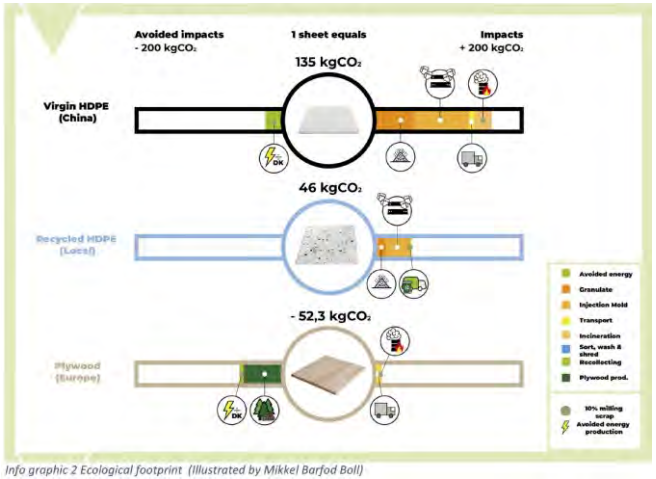


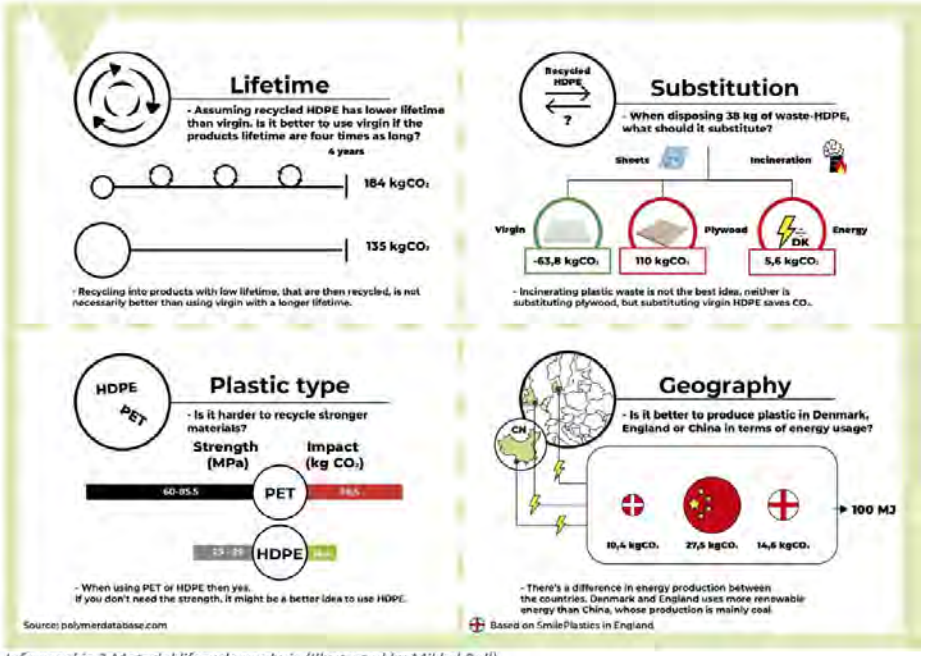



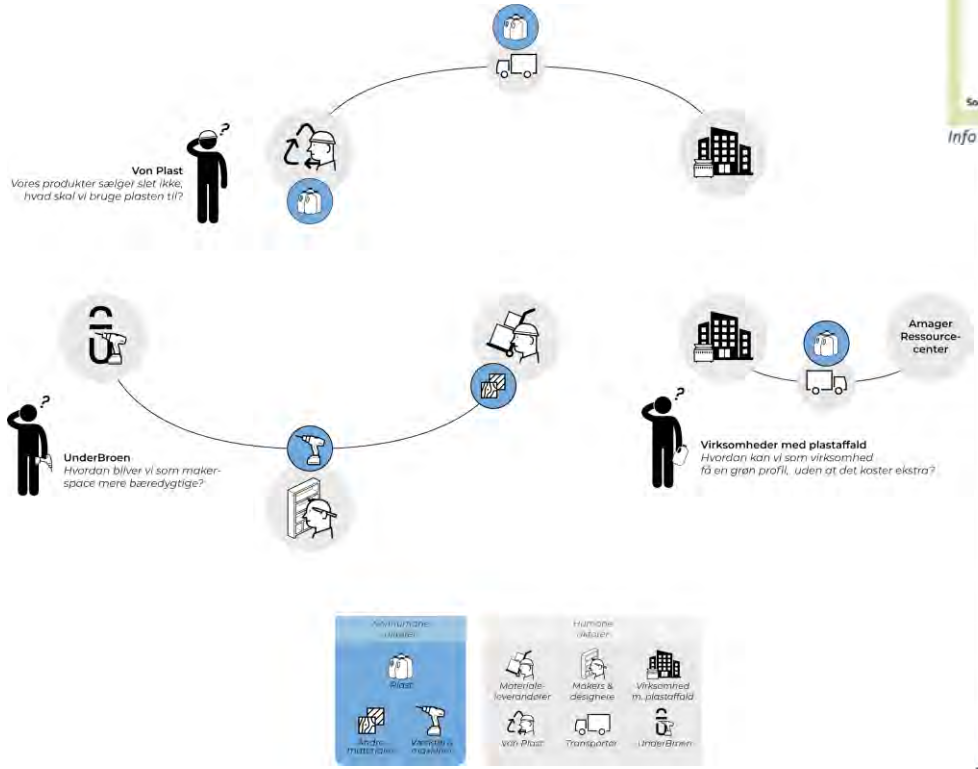

System, geographical and stakeholder collaborative mapping

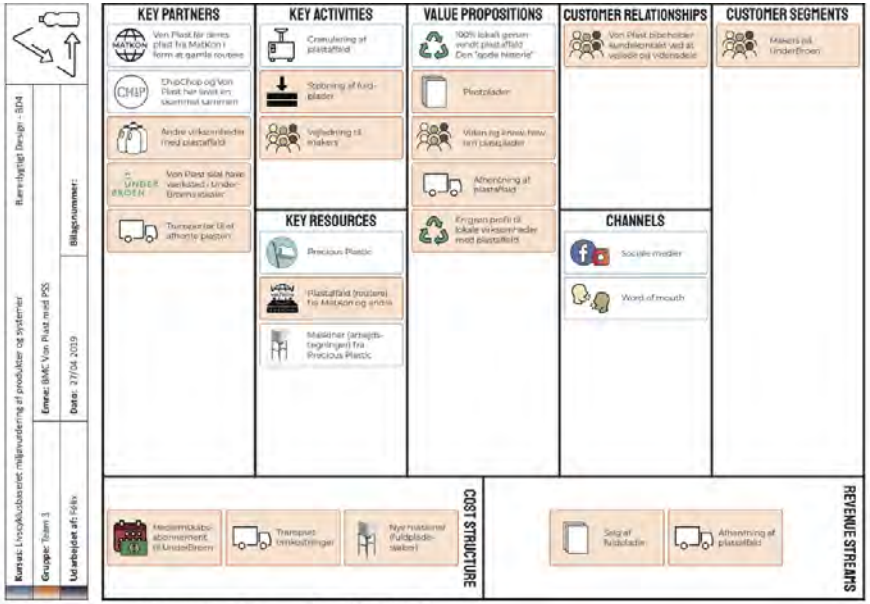



*Info graphic 2 Ecological footprint (Illustrated by Mikkel Barfod Boll)*




*Info graphic 3 Material lifecycle analysis (Illustrated by Mikkel Boll)*




*Model 3 Business model mapping (Illustrated by Félix Elkær Nicot)*

# Simplified life cycle analysis results, process map and business model canvas

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

How can local micro entrepreneurs, SMEs, commercial resellers, citizens and municipal waste management systems collaborate on a local, circular production model for small to medium scale industrial plastic waste recycling in Copenhagen? Facilities, systems and workflows are needed to ensure "triple bottom line" sustainability in local recirculation of materials involving. Awareness and incitement to recycle, produce and consume more sustainably is needed.

## NEEDS

What are the needs ?

- demand for sustainable solutions and circular alternatives to traditional production models, thus addressing challenges of resource scarcity, negative environmental impact of the traditional (linear) production models and lack of alternate models to manage and recycle waste, as well as changing consumption patterns from a triple bottom line and holistic approach (people, planet, profit). -access to the necessary resources (economic, technological, knowhow, etc.) to pursue circular economy enterprises in this target group; an unmet need for accessible production facilities, services and equipment, as well as best practice models and knowhow in circular economy practices, such as material knowledge, knowhow and collaborative models in recycling, sourcing, as well as business cases

## IDEAL SOLUTION

If the problem was solved, what does it

A working system involving various stakeholders actively in carrying out tasks in all steps of the circular system: from collecting plastic waste to producing new goods, and the return of the material for recycling again. PIPO based on the implementation of five systemic and stakeholder functions generic to any city: 1) 'Generators' of plastic waste: SMEs and small scale manufacturers generating plastic waste as a bi-product, 2) 'Processors' of plastic waste: facility/ies with knowhow and equipment to turn plastic waste into new building material to offer in a local market, 3) Producers – micro entrepreneurs and small scale manufacturers turning these building materials into new locally produced goods, 4) Resellers, as a potential intermediary between producers and their end-buyers, and finally 5) End-buyers/micro generators: consumers of locally sourced/produced goods, that by the end of their product's life cycle turn into 'micro generators' of plastic waste to be reintroduced into the circular production system.

## IDEA

1) Sourcing directly from households

2) Material bank for recycled materials

3) Establishing a Circular Design Lab (CIDE Lab) - A local recycling and circular economy R&D unit

4) Circular production and design manuals and training for recycled materials (open source, sharing platform)

5) Recycled material catalogue and data

6) Locally produced sheets of recycled plastic (alternative to SMILE plastic)

## VALUES TO ACHIEVE

1) Household waste is currently a difficult fragment type to process effectively.

2) Local database of plastic sources (processed and potential raw material)

3) Privately run alternative to waste management, closing the gap from magagement and recycling to consultancy in waste mangement and product development targeted at user groups (privagte/ commercially) that do not have the knowhow or resource to transition.

4) Innovative design practices, experimentation and testing, collaborative effort in defining the design manual

5) Physical or digital catalogue of concepts, products and materials to be updated on a continuous basis

6)

## HOW ?

1) Solutions to cleaning and sorting household waste (e.g. plastic) + behavioral change

2) Co-creation of a circular design manual in collaboration with the stakeholder group - design sprints (qualitative and quantitative data collection during the design sprints) - stakeholders as peer reviewers

3) Using small(er) scale machines and facilities for testing and prototyping

## Comments

The project has received funding from the European Union Horizon 2020 Research and innovation programme under the grant agreement n°788217

# EXPERIMENTATION CANVAS

Underbroen (Maker)

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

To prototype and test (within phase 4 timeframe) a circular system at the local level that support the innovation of plastic recycling and high quality recycled plastic materials.

To allow local stakeholders to benefit from higher value materials to extend the quality, the durability and economic viability of circular design, production and business models.

To support the locally engaged stakeholders and broader maker-community in design and knowledge provision regarding circular design and production.

To prototype and test a closed loop for recycled plastic that can then be scaled on a city level.

## TARGET GROUP

Local makers, designers and micro entrepreneurs

Local circular initiatives

Municipal recycling facilities and initiatives

Plastic recycling companies

## YOU NEED TO AGREE ON

Logistic model and participants

Effective support in term of circular design and production

Time of experimenting (phase 4)

Circular design manual (Sustainability strategies)

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Management of phase 4 - prototyping stakeholder model - prototyping designs and circular products - prototyping recycled plastic sheets - synchronisation with the different stakeholders - prototyping end-user return models

## TIMELINE / MILESTONES

Phase 1: August'19-January'20
Implementation of the Generator-Processor-Producer system model. We will roll out a small scale prototype of a resource recycling system focused on the technological, logistical and system implementation of the Generator-Processor-Producer system

August 2019

Phase 2: February'20—August'20
Implementation of the full system model. In the second phase we will scale up the capacity of the system implemented in the previous phase (i.e. engage more actors) and implement the remaining two functions of the system model, Resellers and End-buyers/Micro processors. It is also our ambition to support the conceptualization and tentative establishment of CIDE Lab.

June 2020

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ? Any material requirements?

Systemic model prototype (circular loop for plastic)

3-5 designs and product prototypes

Recycled material prototypes (recycled plastic sheets)

Circular design and production manual (fab city)

Recycled material catalogue (prototype)

Material Requirements:
- Machines and tools for prototyping plastic sheets and products

## WHERE AND WHICH SCALE ?

Copenhagen

Underbroen (small scale prototyping)

Betafactory (medium scale prototyping)

CIDE Lab (larger scale prototyping and production)

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Local stakeholders are engaged in the co-creation process with valuable outputs (feedback)

Succesful prorotypes of recycled plastic sheets

Proved min. 3 designs that a feasible in a circular business model

Knowledg and learnings from SISCODE are transfered to CIDE Lab

## COSTS STRUCTURE
How will you expense the budget ?

Access to Processing facilities €8-12.000
Costs of transport, waste materials, stakeholder workshop materials and accomodation, and exhibitions €1-2.500

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Data collection from involved stakeholders

Monitoring turnover in the overall system as well as in the respective functions and services (i.e. monitoring costs, revenue, productive hours, etc.)

Monitoring the surrounding inputs/outputs to conduct a second life cycle analysis on the system based on the data collected

Interviews and qualitative assessments

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

1) Re-engage local designers and makers in designing and prototyping (design sprint)

2) Establishing (getting access to) need facilities, machines and tools

3) Begin prototyping and designing circular products (plastics)

4) Re-engaging municipal initiatives and policy makers

## Comments

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SISCODE

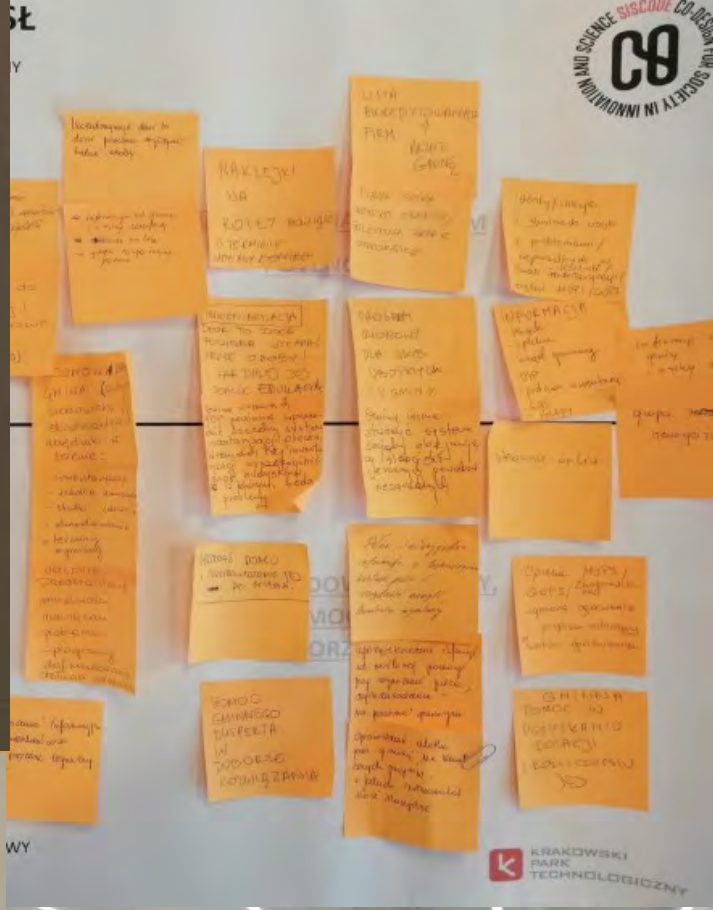
# Visual synthesis

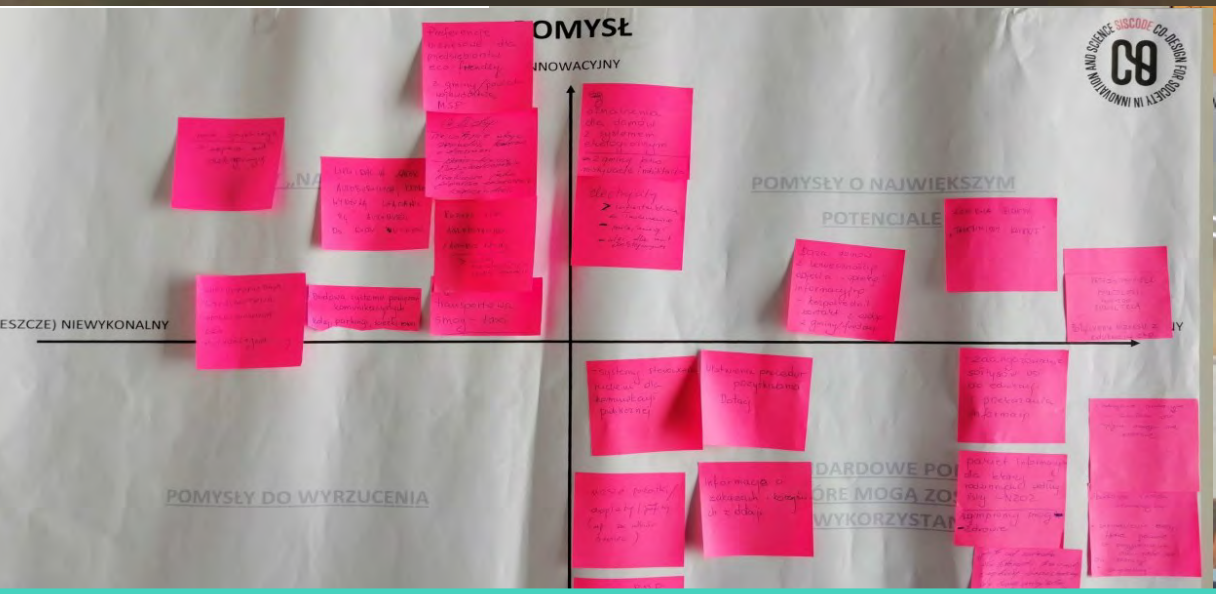
Air pollution, policy, air protection programme, local context, inhabitants needs, inhabitants involvement

KTP

How to improve the quality of the air in Krakow by motivating citizens to change their ecological attitudes, transportation and heating habits and to support decision makers with relevant tools and instruments for the co-creation of local new policies ?

Preparation of the new Air Protection Programme for Malopolska


Pictures of workshops and design tools as the idea selection canvas

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

to **improve the quality of the air** in Krakow and Malopolska by **supporting decision makers in creating the updated regional policies and programs**

## NEEDS

What are the needs ?

To elaborate APP for Malopolska including multidimensional perspective of different stakeholders

To motivate citizens to change their ecological attitudes, transport and heating habits and support decision makers with relevant tools and instruments for better co-creation of local new policies with user centered approach

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?

*The new APP is introduced in the region and all different stakeholders start to implement the regulations, as they are in line with their needs and expectations.*

*Inhabitants understand the restrictions that the new law brings to their life and business*

## IDEA

Ensure wide participation of different stakeholders in the proces of creating local polices

Create an open platform for direct discussions between different target groups

Create bottom-up initiatives to support policy implementation

## VALUES TO ACHIEVE

Deep understanding of problems of different groups of stakeholders

Boost creativity, generate ideas, meet expectations of different target groups

Achievement of common vision and approach among varied stakeholders

Raised awareness of inhabitants on the air quality issues

## HOW ?

1st workshops (personas, idea selection)

Meetings with local communities

2nd workshops (project canvas)

Monitoring and validation (hackathon)

## Comments

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# EXPERIMENTATION CANVAS

KPT Living Lab

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

Prototype the main assumptions of the APP among regional decision makers (Tarnów, Nowy Sącz, Chrzanów, Nowy Targ, Kraków)

To allow local decision makers to increase their input in the APP from their local perspective

To support 5 local communities (Tarnów, Nowy Sącz, Chrzanów, Nowy Targ, Kraków)

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

Already binding legislation acts

Report summarising the workshops

EC recommendations and regulations regarding air protection (air quality standards)

National recommendations and regulations regarding air protection

## WHERE AND WHICH SCALE ?

Tarnów, Nowy Sącz, Chrzanów, Nowy Targ, Kraków

## TARGET GROUP

Local and regional authorities,

3 mln inhabitants of Malopolska region,

Academia, business, NGOs

## YOU NEED TO AGREE ON

Model and methodology of prototyping phase
Timeframe
Monitoring the indicators measuring the implementation of APP regulations

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Local community engagement and satisfaction
Policy makers awarenets and involvement
Final version of APP ready to be implemented in 2020

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Management,

Close partnership and cooperation with regional authorities,

## COSTS STRUCTURE
How will you expense the budget ?

Costs of the meetings, travels of KTP team to local communities

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Reporting (KTP and regional authorities)
Individual and collective feedback

## TIMELINE / MILESTONES

Prototyping (July – September 2019)
Demonstrating and testing (October – December 2019)
Monitoring and assesing (till June 2020)

August 2019 — June 2020

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

Meet the stakeholders to discuss and agree on the proposals
Plan the dates of the meetings with local authorities
Invite all interested stakeholders
Conduct the meetings
Report the meetings

## Comments

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Icons by Gregor Cresnar from the Nour Project

# SISCODE

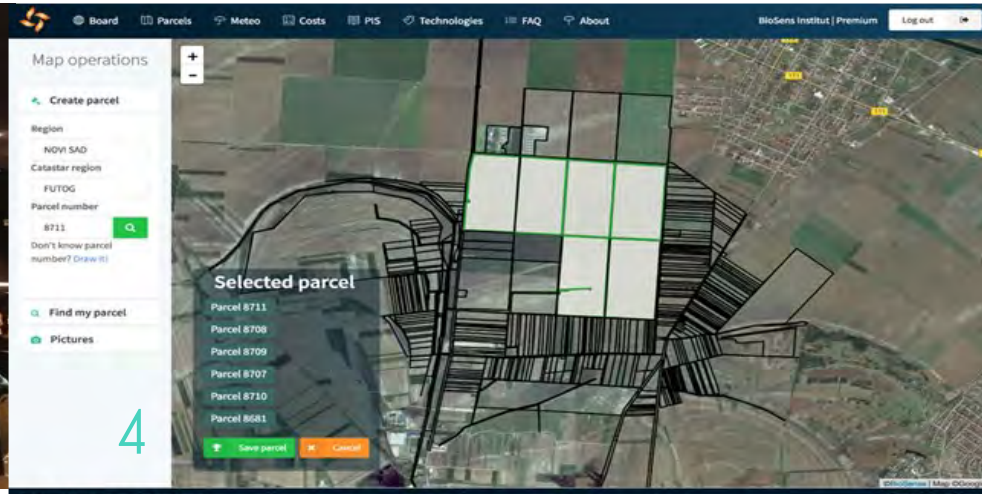
ICT in agriculture, innovative learning methods, Big Data, precision agriculture, farmers

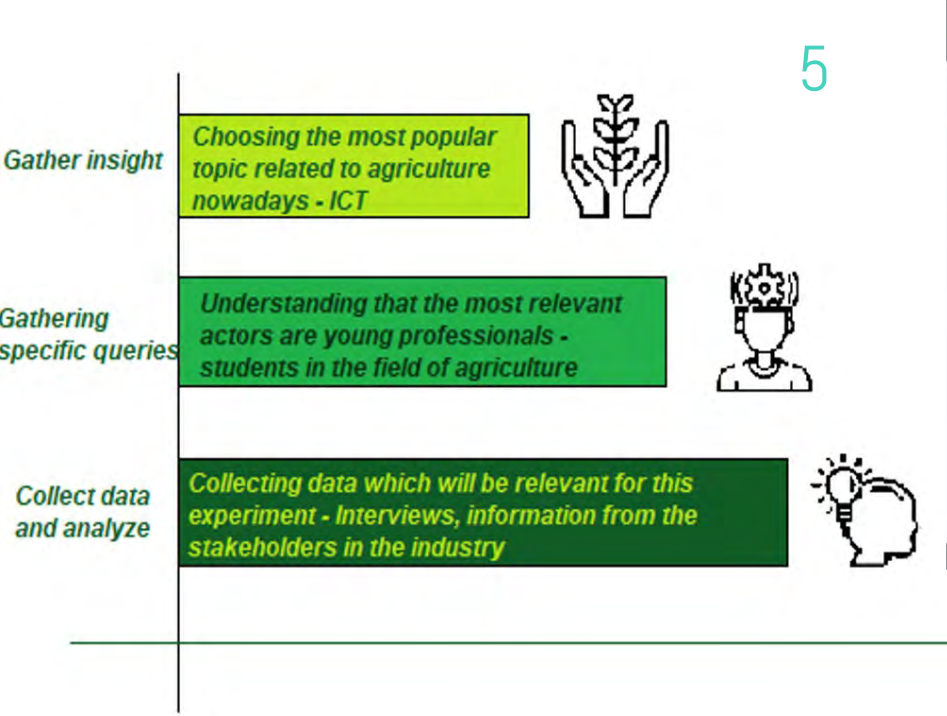
## Visual synthesis

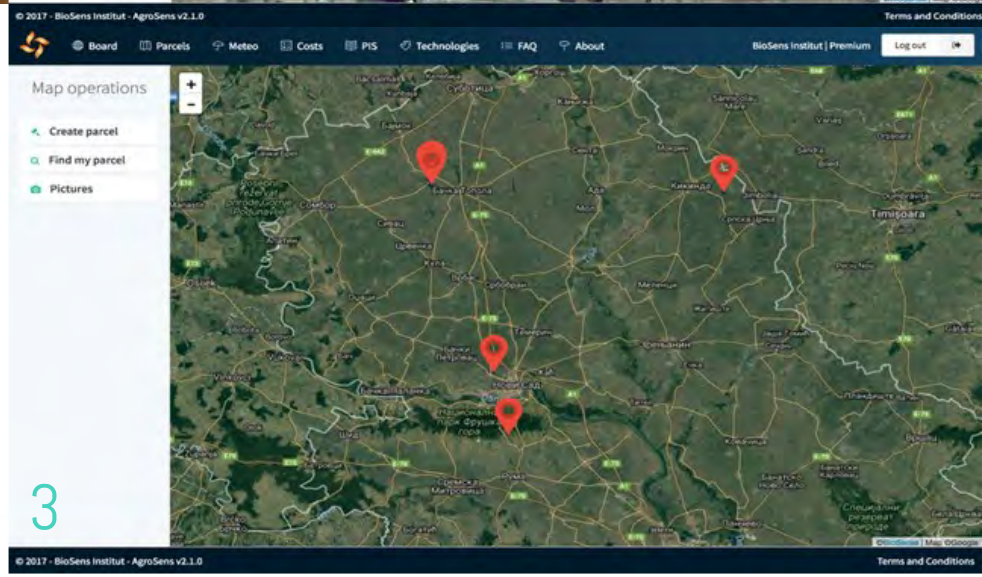
PA4ALL

How to introduce ICT in high schools specialized in agriculture in a way that fosters the development of specific skills, greater connection to market needs and relevance for agriculture of the future?

ICT based education in high schools specialized in agriculture


(1) Students in Futog (2) Picture of the PA4ALL workshop in highschool (3) AgroSense map operations (4) AgroSense parcel selection (5) Method schemes

## Pictures of events and Map realised during the first phases

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

Introducing precision agriculture tools in high-schools for agriculture and uptake of innovation by presenting the benefits of using the ICT and engaging stakeholders such as farmers, agriculture high schools and education policy makers.

## NEEDS

What are the needs ?

The introduction of ICT subjects in agriculture courses, inclusion of ICT in agriculture schools, increase the awareness of the relationship between technology and agriculture

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?

*By delivering innovative ICT solutions that are accessible to all farmers, regardless of the size of their holdings, it is important to envision providing small farmers of the region with affordable enabling technologies, that will allow them to become sustainable in the global competitive environment. The introduction of ICT subjects in agriculture courses, and inclusion of younger generations could increase the awareness of the relationship between technology and agriculture in order to increase the productivity of the fields and at the same time make more attractive the agriculture for younger generations.*

## IDEA

Introducing precision agriculture tools in high-schools for agriculture and uptake of innovation by presenting the benefits of using the ICT and students' engagement.

The proposed solution is to develop, with the student's input, the ICT lab in the agricultural school in Futog, in Serbia. The main goal is creating opportunities for transfer on knowledge and enabling of adoption of new technologies in the aspect of precision agriculture.

## VALUES TO ACHIEVE

The introduction of ICT subjects in agriculture courses, and inclusion of younger generations could increase the awareness of the relationship between technology and agriculture in order to increase the productivity of the fields and at the same time make more attractive the agriculture for younger generations. Also, due to the existing government strategies which are addressing the existing policies which incentivize ICT in education they could leverage the experimentation of solutions for this challenge and bring the change of mind set which is sorely needed.

## HOW ?

The mechanisms for measurements and data collection will be set in the accordance with the tools designed by the project management. Also, with regards to the prototype, the data measured will directly address the agriculture production success rate, which will also be done with in cooperation with students.

## Comments

The project has received funding from the European Union Horizon 2020
Research and innovation programme under the grant agreement n°788217

# EXPERIMENTATION CANVAS

PA4ALL

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

To prototype – ICT lab for precision agriculture in schools

To allow students to experience the benefits of ICT in precision agriculture and how it can bring to better yield and crops value.

To support an agricultural school in Futog (Serbia) and its students for ICT learning.

## TARGET GROUP

Agricultural school

Students

Teachers

## YOU NEED TO AGREE ON

Participants

Time of experiment

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Management - prototyping - communication and data collection– synchronisation with the different stakeholders

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

Equipment for ICT lab (a lap top with data processing program, meteostation which will gather the data, software for analysis data)

Usual material for organizing knowledge transfer wotkshops

## WHERE AND WHICH SCALE ?

Agricultural school in Futog,

Serbia

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Learning

Knowledge transfer

Benefits

## COSTS STRUCTURE
How will you expense the budget ?

A portion of budget will be spent to equip the ICT lab, another to organize knowledge transfer wotkshops, last for experimenting phase which might include additional equipment.

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Reporting

## TIMELINE / MILESTONES

Creation of ICT lab,

August 2019

Data collection and assesments

June 2020

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

Implementation ICT lab in school

Data collection

Knowledge transfer

## Comments

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SISCODE

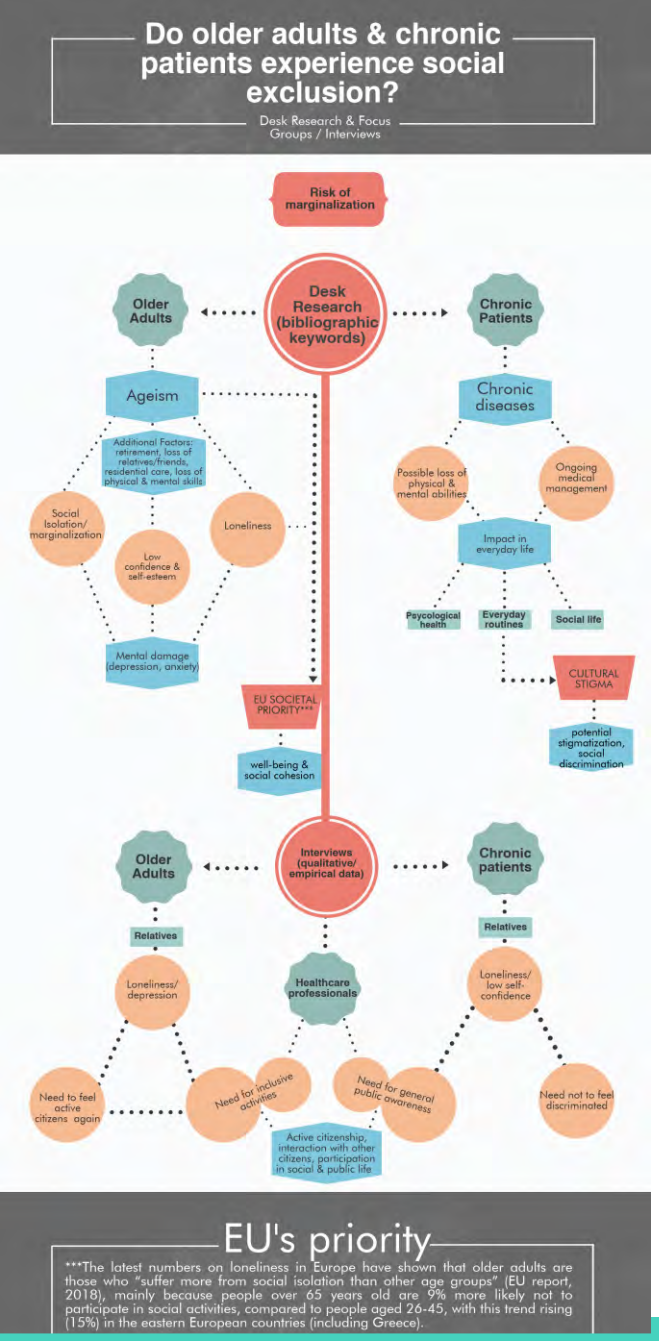
Visual synthesis

Social inclusion participatory research inclusive co-creation activities active citizens open Academia sense of belonging

# THESS-AHALL

How to break the social exclusion walls and welcome older adults and chronic patients back to the society with life-long learning programme ?

"Partners of Experience", participatory research programme for older adults and chronic patients






Infographics made with Piktochart for synthesing the design research

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

Ageism and the risk of social exclusion of older adults and chronic patients

## NEEDS

What are the needs ?

To build inclusive, participatory research activities, based on stakeholders' needs, in order to engage them in social action and increase their sense of active citizenship and socially included.

Need for making the Accademia more accessible to embrace co-creation/ to make value for specific vulnerble groups through their participation in research (What is in for them?)

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?

*Older adults and chronic patients feel socially included and active citizens again, through their active involvement in* co-creation, open science and social research activities*, as equal partners and ambassadors (Partners of Experience) of the scientific community*

## IDEA

Thess-AHALL aims to fight the risk of loneliness and ageism while increasing the social inclusion in the ageing population and chronic patients, by opening the "University's doors" and using co-creation, open science and social research as its means.

## VALUES TO ACHIEVE

"From Science in Society to Society in Science"

"Not research just for Research, end-users not to be treated like subjects"

"Citizens in the centre of participatory research to co-design solutions for personal needs and also for societal issues"

"Participation in research as a means for action and social inclusion"

"An "open" Academia is the key for effective inclusion in co-creation and responsible research"

"Partners of Experience are equal to any other research partner"

## HOW ?

The proposed solution is a coherent and complete participatory research programme for older adults and chronic patients, based on the previous positive feedback of sensitive population groups, regarding their involvement in Lab's activities. The proposed solution aspires to set these target groups in the centre of the research activities for a whole academic year, as other "researchers", equal to Lab's staff. Being in the "shoes" of researchers, older adults and chronic patients will become "Partners/Researchers of Experience" in real-life context/activities, like:co-creation sessions, lectures to students, assignment of semester projects, do research on topics of their interest and disseminate the outcomes, participation in local conferences, open academic events, knowledge exchange with other university entities etc.

## Comments

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# EXPERIMENTATION CANVAS

Thess-AHALL

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

To prototype a programme of inclusive research activities to fight the risk of loneliness and ageism while increasing the social inclusion in the ageing population and chronic patients, by opening the "University's doors" and using co-creation, open science and social research as its means.

## TARGET GROUP

**Main target group:** Citizens (older adults & chronic patients), patients associations **Main stakeholders:** the Academia, healthcare experts , policymakers (municipal and regional authorities), the Civil Society (organisations and NGOs, as supporters of the challenge)

## YOU NEED TO AGREE ON

Time of experiment
Reach strategic partnerships with the University and policymakers for joint activities
Co-validate the plan of activities with stakeholders

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Management of activities – a systematic involvement of the different types of stakeholders (whenever and wherever is needed within the prototype phase) – determination of the evaluation tools for the challenge – communication of the challenge in the local context (university, the city, the media)

## TIMELINE / MILESTONES

See Gantt on the main deliverable

August 2019 — June 2020

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ? Any material requirements?

A series of inclusive, co-creation and participatory research activities, based on the interests and needs of the primary stakeholders, as well as of the filed of activity of the Living Lab (in order to provide support).

**Material requirements:** physical materials, printouts, stationary for the co-design events, cost for exhibitions and the open events, the participation in local conferences, visits to museums and co-organisation of workshops in other university structures, development of a technological solution

## COSTS STRUCTURE
How will you expense the budget ?

1.200€/activity => TOTAL no. of 10-12 activities within the prototyping period

(meeting the DoA description for the prototyping costs )

## WHERE AND WHICH SCALE ?

Aristotle University of Thessaloniki

Thessaloniki

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

The programme of the activities contributes to the increase of social inclusion of the specific target groups and enhances their self-esteem and sense of active citizenship

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Reports, questionnaires (after each activity), interviews and focus groups

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

- To validate the activity programme with different type of stakeholders
- To ensure the support of the local policymakers and the university for joint participation in citizens' science activities

## Comments

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SISCODE

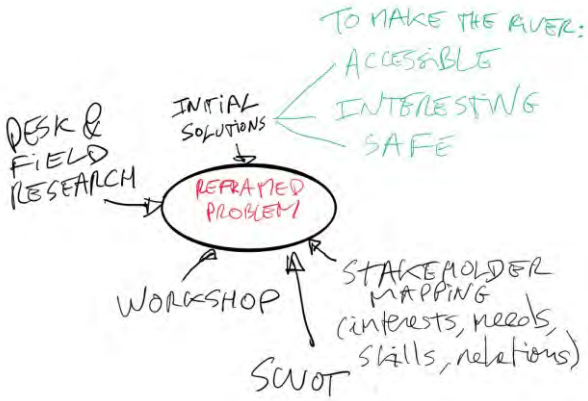
# Visual synthesis

Limited public access to river; connotation of elitism; fear; culture of contemplation vs. immersion in the river

CIENCIA VIVA

What interesting, mobilizing, safe and accessible experiences could our co-lab create in the river in this part of the city?

Build your own boat/Bring your own boat
A yearlong workshop for construction of life-sized, usable watercrafts

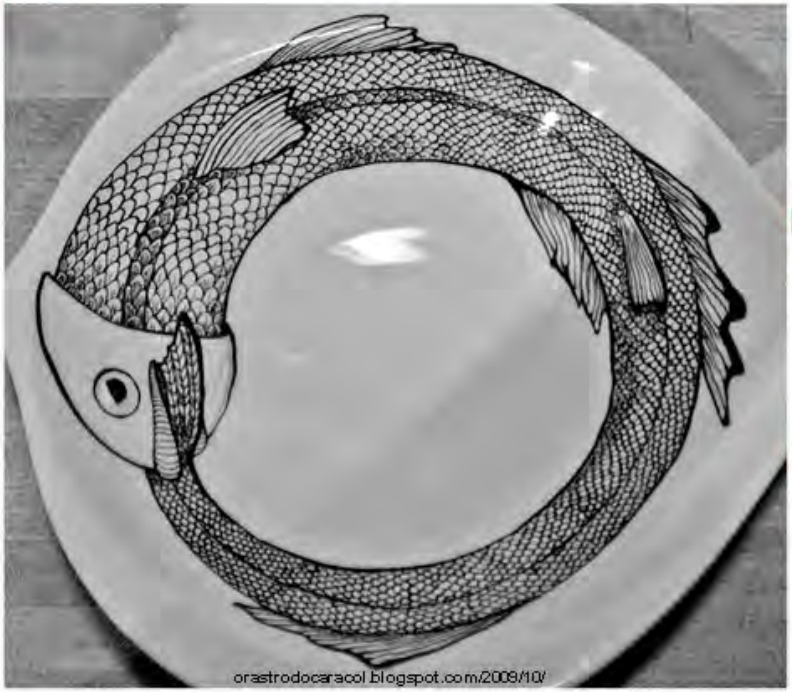



Connotation of elitism

No users

Connotation with risk

No profit




Lack of time

No motive for investment

Distance

Lack of care

No public acces to river

Limited infrastructure


Picture of participative observations, fish metaphor, SWOT analysis and Hand draft mindmap

# IDEA CARD CANVAS

## CHALLENGE
What challenges are you addressing?

What interesting, mobilizing, safe and accessible experiences could our co-lab create *in* the river in this part of the city?

## NEEDS
What are the needs ?

Activities (sports, leisure, informal, etc.) in the river > public > awareness/demand for improving conditions of the river (access to water, cleaning of the river, etc.)

## IDEAL SOLUTION
If the problem was solved, what does it looks like ?

People of different ages, backgrounds and means would frequent the river, which would host a wide range of activities. Increased public demand would force authorities to invest in improving access to the water and safety conditions for activities in the river.

## IDEA

**Build your own boat/Bring your own boat [provisional]**

Annual workshop for construction of usable watercrafts (rafts, canoes, small boats, etc.), to be tried and shown in multidisciplinary festival devoted to the river/sea.

## VALUES TO ACHIEVE

Fostering activities (sports, leisure, informal, inquiry based, DIY, etc.) in aquatic environments, for health, cognitive devolvement, environmental awareness, citizenship engagement. Create a public to create demand *and* to raise issues related with conditions of the river (access to water, cleaning of the river, etc.)

## HOW ?

The workshops would be open to schools, scouts, makers, the general public, etc. and would have successive modules comprising different subjects: the river, boat design, floatability, boat construction, basic navigation skills, safety, etc. They can be thematic (e.g., boats using no plastic parts; boats using recycled plastics; open source boats; inspired by traditional river Tejo boats, etc.). Crafts constructed would be shown during an event to take place in a river location in the neighbourhood of Pavilion of Knowledge. The event would show the boats in the water (a contest? a race?), and feature a multidisciplinary festival devoted to the river/sea offering a wide range of activities in the river: sports, citizen science projects, cleaning campaigns, tours, etc.

## Comments

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# EXPERIMENTATION CANVAS

CIÊNCIA VIVA

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

Run a limited number (3?) of short/intensive watercraft construction workshops to try for its technical feasibility, with limited, but varied, stakeholder groups.

Design of immersive science faire *in* the river

Test the engagement potential of the package

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ? Any material requirements?

Searching/acquiring/creating templates for DIY watercrafts

Materials watercraft building workshops

Materials for designing science festival workshops

## WHERE AND WHICH SCALE ?

Workshops will take place in the neighbourhood, at local blue school, maritime scouts headquarter, Pavilion of Knowledge. Testing location (also possible location for science festival) to be identified

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Watercraft "contest" proves to be feasible; participants are engaged, satisfied; interesting for "bigger" stakeholders, possible funding, material and legal support is agreed up

## TARGET GROUP

Local maritime scouts; local "blue school " + school with boat construction programme; maker community (from CVIVA network); co-lab stakeholders

## YOU NEED TO AGREE ON

Identify and select participants; convince them to take part in prototyping – what incentives? Agree on shared calendar – complicated because of school calendar.

## COSTS STRUCTURE
How will you expense the budget ?

HR: PMs from CVIVA SISCODE team

Workshops: templates for DIY watercrafts (<100€); materials (<10k€); co-creation events (<5k€)

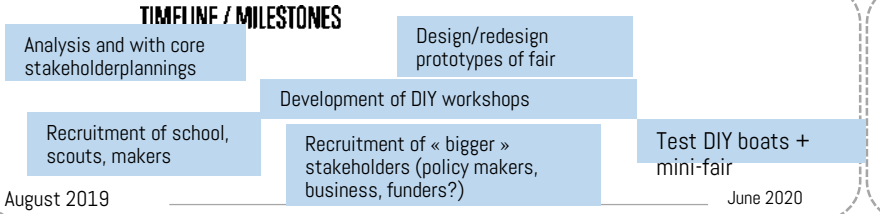
## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Participant observation (workshops)
Qualitative interviews after workshops
Individual + group feedback sessions

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Management and planning – includes research (e.g., DIY boat construction; revision of stakeholder mapping) and stakeholder engagement. Organizing boat construction workshops. Prototyping an immersive science festival in the neighbourhood/river.

## TIMELINE / MILESTONES




## TO DO LIST / NEXT STEPS
Give us a list of your key activities

1. Meet core stakeholders to refine experiment, decide steps, add stakholders.

2. Contact schools, scouts. 3. Research technicalities, material requirements for DIY watercrafts.

## Comments

The project has received funding from the European Union Horizon 2020 Research and innovation programme under the grant agreement n°788217

# SISCODE

## Visual synthesis

Quality of life, ageing society vs ageless society, social innovation, loneliness vs connectedness, social inclusion / empathic society, open mind towards the future, citizens participation

# CUBE

How might we increase/ensure the quality of life of people of all ages living and growing up in the context of an ageing society, now and in the future, drawing on the self-organizing potential of the community in co-creation with policy makers, by broadening perspectives and providing an open mind to the future starting with a pilot in Voerendaal?

*Future Citizens Lab x Ransdaal - Toekomstburgerslab x Ransdaal* - 'Running design labs and use of socoins' as a way to support bottom up social innovation


**Picture on the left** : a parc in Voerendaal, symbolizing that we have a little bit more direction, but still the journey and outcomes are very open.
**Picture on the right** : a snapshot of a workshop with Cube's visitors, representing the fact that ageing society is relevant for ALL people of all ages, not just elderly.

## Pictures of first explorations





Pictures of design sketches and workshop environments

# FRAMEBOARDS

2. **Event:** citizens present their ideas to fellow citizens and policy makers

1. **Workshop:** provide citizens with tools like design thinking and value proposition canvas to develop ideas

3. **Online platform:** ideas are shared online for inspiration, making connections, and finding support / voting by means of socoins → make things happen through collaboration

## FUTURE CITIZENS LAB x RANSDAAL

*where citizens and policy makers connect and co-create their future*

### DESCRIPTION

Future Citizens Lab is a programme consisting of three elements that provide a combination of tools to change perspectives, to share ideas both online and offline (providing a podium) and to realize them by way of social support (socoins).

### VALUE PROPOSITION

Future Citizens Lab helps citizens and policy makers to improve the citizens' quality of life and make communities more future proof, by stimulating and facilitating citizens to co-create their community's future with policy makers and to realize participatory initiatives within and for the community.

### TARGER - USERS

ALL citizens of a certain community (village/ district/ neighbourhood), in this case Ransdaal and their local policy makers

### KEY PROBLEM (s)

How might we increase/ensure the quality of life of people of all ages living and growing up in the context of an ageing society, now and in the future, drawing on the self-organizing potential of the community in co-creation with policy makers, by broadening perspectives and providing an open mind to the future?

### SOLUTION APPROACH

-Provide citizens tools to empower them to find and create their own solutions
-Provide room for experimentation
- bring together people (citizens & policy makers) and ideas

### ALTERNATIVE IDEAS

- Use gamification to help citizens and policy makers to see and explore new future alternatives and explore new ways of democratic policy making
- Use gamification to engage the entire community as well as neighbouring communities in collaborative and/or competitive challenges

### Comments

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# EXPERIMENTATION CANVAS

CUBE

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

We want to test the concept of citizens participation in policy making processes with the goal to realize "real life" projects based on the needs and demands of citizens and policy makers in communities.

## TARGET GROUP

Policy makers and citizens in local communities, neighbourhoods, villages or cities.

## YOU NEED TO AGREE ON

The value of a co-creation journey and the sort of projects.
The value of citizens participation.
The involvement and responsibilities of different stakeholders.

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Stakeholder engagement; co-creation workshop with multiple stakeholders. Prototyping and experimenting with workshop tools. Prototyping and organizing event for citizens ideas. Prototype and experiment with digital environment.

## TIMELINE / MILESTONES

Aug: stakeholder engagement (citizens)

Sep-oct: co-creation workshop (multiple stakeholders)

Nov – May: prototyping and experimentation different elements of the programme

August 2019 — June 2020

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

Material for design thinking and value proposition workshops.

IT structures to realize the use of social bitcoins (Socoins).

## COSTS STRUCTURE
How will you expense the budget ?

Biggest costs are probably the IT structure and the events in which the citizen projects are presented.

## WHERE AND WHICH SCALE ?

Start with community of Ransdaal (900)
Local context neighbourhood, local community, village, city, regional level.

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

The participation of citizens is successful and leads to new, realized projects in their community and a sustainable change in policy..

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Monitoring number of participants, number of projects, policymakers involved and the success of the projects in the sense of citizens expectations.

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

- Discuss prototype/idea with citizens cooperation, municipality, and other stakeholders
- Organize a co-creation workshop with multiple stakeholders to discuss and reflect on prototype, define common ground and find a group of dedicated citizens and policy makers to go on with the experiment

## Comments

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SISCODE

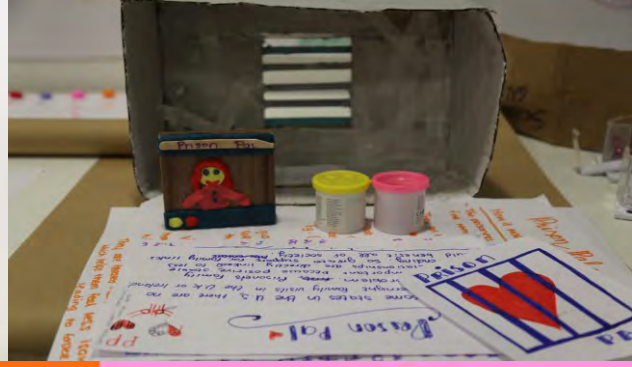
Stress, Anxiety, Depression, Mental Health, Young People, Open Mind

Visual synthesis

# SCIENCE GALLERY DUBLIN

How to improve mental health and well-being management with young people in a secondary school setting

Open Mind: empowering the young people to understand the importance of hobbies for their mental health, and using co-creation techniques for them to be innovative in facilitating the clubs

OPEN MIND

OPEN MIND

#2.12 Subject Matter Experts Interview

"If a young person really advanced in using technology, it means there are other skills they aren't learning."
– Colman Noctor (Psychotherapist in Child and Adolescent Mental Health)

**Biography**

- *Name:* Amelia
- *Age:* 40
- *Gender:* Female
- *Position:* Stay-at-home-mum
- *Education & Experience:* She was a teacher until she had her first child, she has 16 years of experience being a parent.

**Behaviour & Interests**

- She has four children, and made the choice to stay at home until they go to college.
- When she was a teacher she was interested in mental health but thinks everything has changed so much since then for young people.

**"I worry about all of my children, but especially that my son spends too much time gaming, and it seems to making him less interested in school and his friends."**

**Goals & Motivation**

- She wants to see her children grow up and succeed, not only career wise, but also to be happy.

**Needs & Challenges**

- She's worried about her 14 year old son as she thinks he hasn't been sleeping properly at night and has been staying up gaming.
- He's started missing some days at school and she's worried that it might connected to mental health issues.
- She's not sure where to go to get help.

OPEN MIND

Pictures of co-design workshops, personas, interview comment and open mind graphical identity

# IDEA CARD CANVAS

## CHALLENGE

What challenges are you addressing?

Mental health and well-being management in young people.

## NEEDS

What are the needs ?

75% of adults with mental health issues will present symptoms before they are 25 years old. About 70% of health problems and most mortality among the young arise as a result of mental health and substance-use disorders. Ireland has the fifth highest suicide rate in the EU.

## IDEAL SOLUTION

If the problem was solved, what does it looks like ?

Young people are happy, there is a decrease in manifestations of mental health problems such as anxiety, depression and suicide. The stigma is removed and young people can speak openly if they are suffering from any mental health problems. There is a general understanding of the importance of well-being and how to practice it to counter-act mental health issues arising – prevention takes priority.

## IDEA

A training programme for Transition Year students to empower them to:

- Improve well-being throughout the school
- Set up an extracurricular club to explore their hobbies
- Mentor First year students in their chosen hobby

This will be done through training in co-creation, and taking part in modules provided for the teachers to deliver. Students will form their own hobby club for younger students to allow mentorship and improved mental health.

## VALUES TO ACHIEVE

**Students:**

- Opportunity to explore and develop hobbies
- Improve self esteem and empathy
- Sense of purpose and accomplishment
- Improve community atmosphere in school
- Leadership and Management skills

**Teachers:**

- Free training in co-creation
- Improved well-being for whole school
- Atmosphere of inclusivity in the school
- Improved relationships between teachers and students

## HOW ?

Transition Year Students (15-16 year olds) will take part in a programme during school time. This will mainly be led by their teacher who will guide them through modules produced by SGD and the stakeholders. SGD will also do some co-creation training with both teachers and students.

Students will learn about mental health, leadership, management of a club etc with the aim of setting up their own hobby club for younger First Year students. This will allow mixing and mentoring between older and younger students,increase community atmosphere within the school, and use hobbies to improve mental health and well-being.

## Comments

Through the use of hobbies, we hope to improve mental health and well-being in our pilot schools. The schools in the pilot are attended by the student stakehodlers, so they will still feel connected to the project.

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# EXPERIMENTATION CANVAS

SCIENCE GALLERY DUBLIN

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

To prototype a pilot programme that allows Transition Year students to learn about, and improve, mental health and well-being through the creation ofa hobby club.

To improve mentorship and inclusion for young students.

To allow stakeholders to be involved in the building and implementing of the learning modules.

## TARGET GROUP

Transition Year and First Year High School Students

## YOU NEED TO AGREE ON

What to include in the learning modules – this will be done in collaboration with relevant stakeholders.

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

- Engaging local schools to carry out the pilot programme
- Creation of online modules for teachers along with the stakeholders

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

We will ned to develop online learning modules.

We will do this using a high-quality application called « Articulate » which we have managed to gain free access to.

## COSTS STRUCTURE
How will you expense the budget ?

The main costs will be any external experts needed to be brought in for initial training for the hobby clubs. SGD has sourced a free module builder.

## WHERE AND WHICH SCALE ?

Four to five schools, with around twenty students in each course. Mainly schools in Dublin, one will be in Co. Monaghan.

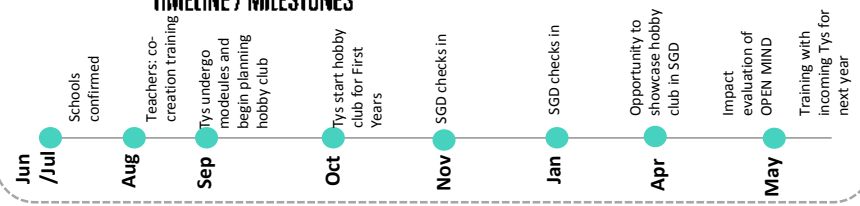
## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

We can show that overall well-being increased in the pilot school.

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

We will carry out pre- and post-surveys both in the pilot schools, and in control schools to see if there is a change.

## TIMELINE / MILESTONES




## TO DO LIST / NEXT STEPS
Give us a list of your key activities

- Connect with interested schools and have them agree to run the pilot in the next academic year
- Create learning modules with stakeholders
- Co-creation training with teachers/students

## Comments

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SISCODE

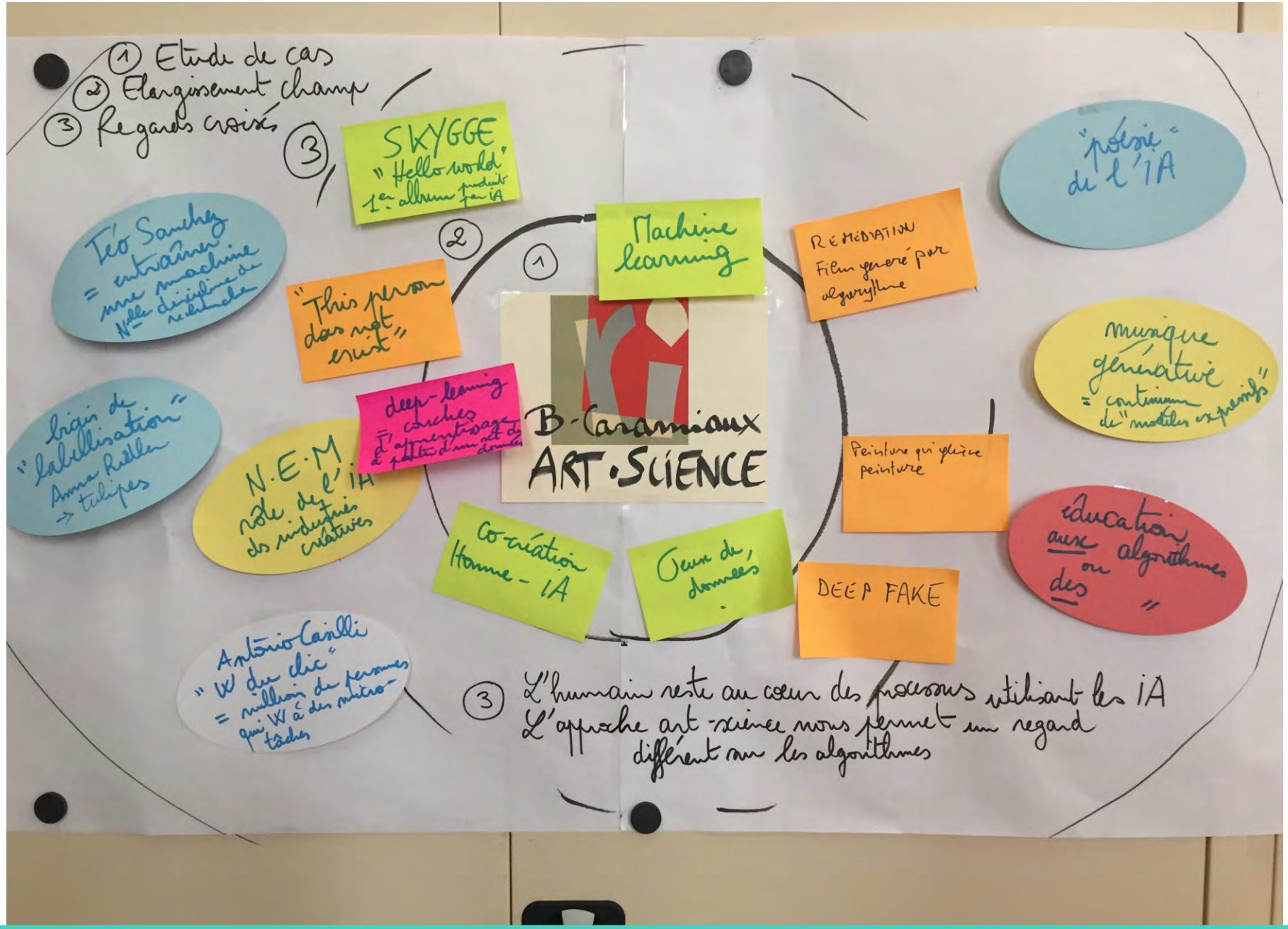
# Visual synthesis

Algorithmic responsibility and intelligibility, User consent, Evolution of professions (doctors, judges etc), Automated decision systems (ADS)

# TRACES

How to organise interactions between research, education, civic right and policy making in order to identify ways to raise awareness of algorithmic decision making within general cultural activities ?

Automated Decision Support as a target for educational / cultural activities.
what would a theatre play, or an informal learning show look like if the audiences where artificial intelligences?




Example of the participative Stakeholder Map



Data visualisation with KUMU

Visualisation of the stakeholders by Kumu software

# IDEA CARD CANVAS

## CHALLENGE
What challenges are you addressing?

How can we maximise synergies betwen public cultural activities and co-construction activities when addressing the issue of making algorithms intelligible by its users

## NEEDS
What are the needs ?

Ensuring that solution-oriented activities become accessible and embed wide-dialogue in their process and conversely public culture activity become integral part of a constructive process ?

## IDEAL SOLUTION
If the problem was solved, what does it looks like ?

People more informed and with more critical thinking questioning for instance…

What would a theatre play, or an informal learning show look like if the audiences where artificial intelligences?

## IDEA

Meta-Level: Use cultural activities as contribution for co-construction

Co-constructing an action where we simulate actions as if we were algorithms

## VALUES TO ACHIEVE

Ensure that the issue of accessibility, engagement, dissemination (main goal of public cultural activities) enter in co-construction process without renouncing to practical results, engagement, solutions (goals of co-construction activities. And Vice-Versa

## HOW ?

Experimenting on the organisation of public events capable of providing valuable inputs for co-construction.

Specific to the theme of « IA awareness »:

Stage 1: reframing. One or two open workshops with artists, designers, scientists, exhibitions fan.

Stage 2: actual prototyping of 2 / 3 ideas

Stage 3: semi-public performance with feedback

Stage 4: refinement of prototype

## Comments

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# EXPERIMENTATION CANVAS

## GOALS FOR THE EXPERIMENT
What do you want to test ? Why ?

t

Raising the general awareness about the presence of artificial devices helping us in daily or complex choices.

The proposed idea would have an impact in raising the interest of policy makers, and all relevant stakeholders.

## TARGET GROUP

Artistes, designers, and scientists already involved

A large group of visitor for the interactive and feedback performance.

## YOU NEED TO AGREE ON

The core idea and different modes of interventions for building the action

## KEY ACTIVITIES AND RESPONSABILITIES
What kind of activities are required to the implementation of the plan?

Stage 1: reframing. One or two open workshops with artists, designers, scientists, exhibitions fan.
Stage 2: actual prototyping of 2 3 ideas
Stage 3: semi-public performance with feedback
Stage 4: refinement of prototype

## MATERIAL / PROTOTYPES
What physical prototypes you will need to develop ?
Any material requirements?

Devices / Materials for events

Potential Hybrid Artefacts

## WHERE AND WHICH SCALE ?

Paris

## THE EXPERIMENT IS A SUCCESS WHEN ?
What criteria/value you would like to assess ?

Ensure that the issue of accessibility, engagement, dissemination (main goal of public cultural activities) enter in co-construction process without renouncing to practical results, engagement, solutions (goals of co-construction activities. And Vice-Versa

## COSTS STRUCTURE
How will you expense the budget ?

Difficult to estimate at this stage

## HOW TO COLLECT DATA DURING THE EXPERIMENT ?

Gathering intermediate object of design and feedback from participants

To be defined with partners and stakeholders

## TIMELINE / MILESTONES

Creation of the core group

Prototyping Experiment Prototyping Experiment Assess

August 2019 — June 2020

## TO DO LIST / NEXT STEPS
Give us a list of your key activities

Refining the idea and framing the intervention with stakeholders

## Comments

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