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# D2.3. REPORT ON STUDY VISITS IN BELGIUM, FINLAND, LITHUANIA AND SPAIN

Work Package 2 – Connect & expand

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## Executive Summary

This documentation summarizes the key findings and results of two strategically conducted study visits. These served as key milestones of the project and were consistently conducted using collaborative co-creation and design thinking methods. The overarching goal was to bring together experts, researchers, and industry partners to discuss the most important challenges and future-oriented potential in the agricultural and food sector. The focus was on the essential role of Living Labs (LL) as innovation accelerators in Europe.

The four study visits had different thematic focuses:

- First study visit (Kortrijk, Belgium, May 6-7, 2025): The focus was on the complex topic of data management and digitalization as a service for industrial food processing (the "Tech Lane").
- Second study visit (Seinäjoki, Finland, June 24-25, 2025): The focus was on the challenge of consumer acceptance of novel foods (especially precision fermentation) and the role of living labs in sampling and testing new products.
- Third study visit (Vilnius, Lithuania, November 24–27, 2025): The focus was on strategic networking and Living Lab financing to transform collaborations into investment-ready solutions and bridge the gap between research and market readiness (the "Valley of Death").
- Fourth study visit (A Coruña, Spain, February 25-26, 2026): The focus was on the practical implementation of Digital Twins as well as the critical foundations of data access, quality, and cybersecurity for SMEs in the Agrifood sector.

After an in-depth problem analysis and thematic introduction, key themes were identified in all workshops. The subsequent group work focused on developing concrete solutions for these themes. The problem-solution canvas provided a methodological framework for translating these approaches into potential, implementable solutions.

## Introduction

The main objective of SIXFOLD is to promote the twin transition of the European agri-food industry and accelerate the adoption of deep-tech innovations. To this end, SIXFOLD is building a regional network of Living Labs across the EU that serves as a dynamic ecosystem for experimentation and collaborative knowledge exchange. To disseminate this knowledge and identify barriers, study visits to four different Living Labs have been organized. These visits include workshops focused on finding solutions to specific "barrier cases" (regulatory, technical, or operational hurdles) that are blocking deep-tech innovations in the sector.

### **First Study visit: Digitalization and Data Challenges in Kortrijk, Belgium**

The first study visit took place from May 6<sup>th</sup> to 7<sup>th</sup> 2025 in Kortrijk and was organized by Flanders Food. The choice of location was strategic because three different Living Labs are located here, making the location a "tech lane" for the relevant topics of food, technology, digitalization, and deep tech.

The discussions focused on data as a common denominator, which is crucial in various environments, from the production line to the Living Lab. The visit focused on data challenges in an industrial food processing plant as an example. Key topics were data acquisition methods (e.g., sensors), data monitoring and visualization, and data architecture and management. Critical aspects such as data sovereignty and confidentiality were also discussed, and a demonstration illustrated how real-time data drives operational roles (supervisors, cobots, AMRs) and their decision-making.

### **Second Study visit: Novel Food - Acceptance and Precision Fermentation in Seinäjoki, Finland**

The second study visit, organized by the Seinäjoki University of Applied Sciences (SeAMK), took place from June 24 to 25, 2025, in Seinäjoki, Finland. Seinäjoki, the heart of Finland's "Food Province" South Ostbrothnia is home to the largest meatpacking plant in the Nordic countries and contributes almost a fifth of Finland's total food production. The SEAMK Food Labs support local SMEs and larger companies through intensive collaboration in education and research.

This case addressed a watershed moment in the food system: new foods and production methods, especially precision fermentation and cell-based meat, offer significant opportunities but market launch faces high regulatory hurdles and can overwhelm end consumers. The focus was on how living labs support companies and customers in sampling and testing novel foods, and on the challenges that can arise when organizing trial runs and tastings.

### **Third Study visit: Strategic Networking and Living Lab Financing in Vilnius, Lithuania**

The third study visit, organized by AgriFood Lithuania, took place from November 24 to 27, 2025, in Vilnius. As a key Baltic innovation hub, Vilnius provided an ideal setting to explore the synergy between Deep Tech, the social economy, and financial sustainability, strategically timed to coincide with major European innovation events.

This case addressed the "Valley of Death" between research and market readiness by focusing on how robust networking and sustainable financing models can de-risk innovation. Participants engaged in ecosystem mentoring during the ENACT Hackathon and the Innovate-EU deep-tech initiative, while contributing to expert panels at the AgriFood Forum. These interactions highlighted Living Labs as central interfaces between policy, business, and science. The methodological focus lay on transforming partnerships into long-term investments. Site visits to the FTMC and Vilniaus kolegija (VIKO) explored high-tech infrastructure requirements, while subsequent workshops developed strategic frameworks for SME investment. A key outcome was the "Investment Readiness Kit," featuring targeted roadmaps, one-stop-shop platforms, and investor-oriented metrics. The visit illustrated how Living Labs can move beyond project-based funding by establishing professional standards and transparent storytelling, creating a visible and investable ecosystem for the Agrifood sector.

### **Fourth Study visit: Digital Twins - Implementation, Data Security, and Skills in A Coruña, Spain**

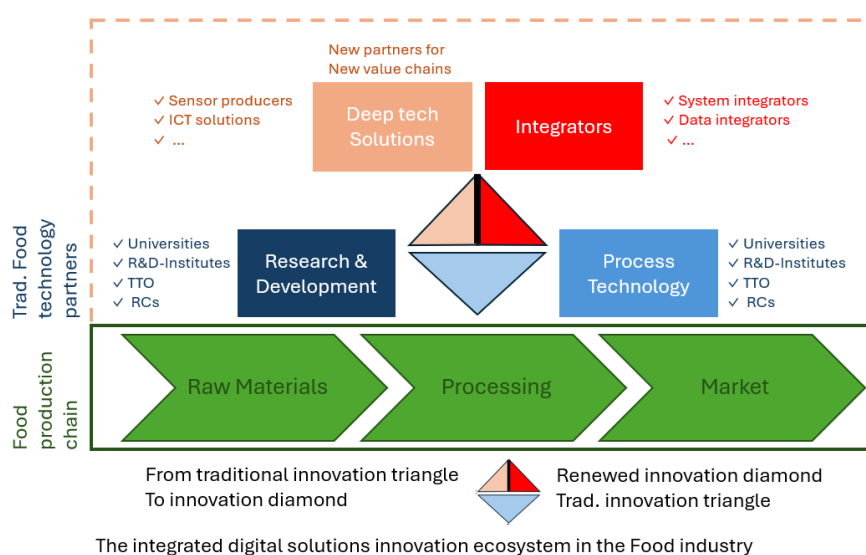
The fourth study visit, organized by the Instituto Tecnológico de Galicia (ITG), took place from February 25 to 26, 2026, in A Coruña, Spain. ITG is a leading benchmark in the regional Agrifood ecosystem of Galicia, providing a high-tech environment through its specialized Living Labs, such as the CSA (Cybersecurity & Data) and the Galaxy Lab (Drones & Sensors). These facilities serve as a vital link for SMEs to access advanced digital tools and research-driven innovation.

This case addressed the practical deployment of Digital Twin technology and the critical infrastructure required to sustain it. The discussions focused on two major pillars: the "Skills Gap" hindering the adoption of digital models and the technical challenges regarding "Data Access, Quality, and Cybersecurity." The visit highlighted the role of Living Labs as neutral intermediaries that help companies navigate the "twin transition." Key topics included the creation of standardized data-sharing methods, the implementation of Asset Administration Shells (AAS), and the development of "Secure-by-Design" channels to protect data sovereignty. The session illustrated how Living Labs can demystify complex technologies through physical showcases, providing SMEs with the necessary trust and evidence-based ROI to invest in digital transformation.

# 1. Understanding the context

## The Agrifood system

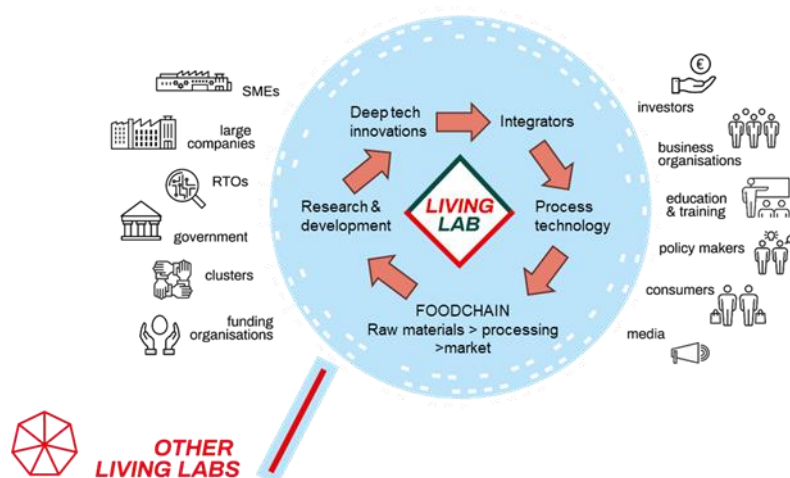
The innovative agri-food system is very complex with a diversity of stakeholders from the quadruple (Citizens, Government, Industry, Academia) or sometimes even quintuple helix (including the Environment). As stated in D1.3, new players such as integrators take an increasingly important role in this system, facilitating the uptake of development in deep tech along the value chain from farm to farm.



**FIGURE 1: LIVING LABS AS BRIDGES.**

Living Labs serve as a crucial bridge, linking the supply side of (deep) tech and integration solutions as well as innovations deriving directly from research with the demand side, companies within the agri-food chain that face real-world challenges. By facilitating collaboration between development, validation, and real-life implementation, Living Labs create a mutually beneficial environment for all stakeholders.

Positioned at the heart of the ecosystem, Living Labs foster cross-sectoral collaboration, driving the advancement of deep tech solutions for the food industry and ensuring innovation is both impactful and applicable in real-world settings.



**FIGURE 2: LIVING LABS AS INNOVATION HUBS FOSTERING CROSS-SECTORAL COLLABORATION, DRIVING THE ADVANCEMENT OF DEEP TECH SOLUTIONS FOR THE FOOD INDUSTRY.**

Within this project, we use the network of the well-established partnership of smart solutions 4 Agrifood (SS4AF) in its function as network of Living Labs to join forces and gather stakeholders along the values chain and quadruple helix (4H) ecosystem to tackle barriers that prevent deep tech innovations in the Agrifood ecosystem.

To do so, the methods of co-creation and design thinking are increasingly popular ways to engage stakeholders, promote out-of-the-box thinking, gain unexpected answers and build trust between different actors.

### Why study visits?

To raise awareness and enhance knowledge on the existing Living Labs for testing deep tech innovations in the agri-food industry and to exchange on best practices and different approaches, study visits will be organised to 4 different Living Labs located in the regions of the SIXFOLD partners.

Most importantly, workshops will be setup during these study visits, to explore and find solutions for the Barrier Cases. Via these study visits all relevant stakeholder in the agri-food innovation ecosystem, agri-food companies, deep tech innovators, regional authorities, funding agencies, RTOs, clusters and other innovation intermediaries, will get acquainted with various regional Living Labs in the EU and the ecosystem of supportive organisations revolving around them and learn about the specific expertise and knowhow they can provide.

Also, these intensive exchanges will increase knowledge on experimentation frameworks for testing innovations and more concretely on the capabilities of these individual Living Labs, how they are operated and managed, how the different Living Labs can complement and support each other, and what is lacking. Competition and duplication within EU regions limit the development of critical scale in Europe. Collaboration between complementary EU regions is more effective, efficient and sustainable than competition.

## 2. Co-creation and design thinking as tools

### 2.1 Co-creation

The term co-creation dates back to the 1970s and was shaped further during the early 2000s<sup>1</sup>.

At the core of the co-creation approach is the belief that involving diverse stakeholders in the innovation process leads to better results. This approach emphasizes the collaborative development of ideas and solutions, actively contributing the knowledge and perspectives of all participants. This collaborative design not only leads to solutions for implementing technologies, but also to a deeper understanding and greater acceptance of the developed innovations.

The co-creation approach, which involves collaborating closely with various stakeholders, yields significant benefits that go beyond simple problem-solving. By actively listening to and integrating diverse perspectives, it fosters "out-of-the-box" thinking, generating input one might never have considered independently. Furthermore, co-creation helps avoid the "tunnel vision" that often arises from deep immersion in a challenge, leading to unexpected answers and uncovering questions whose existence was previously unknown. Crucially, the joint discussion and collaborative work on challenges and innovations actively builds trust among all participants.

A key success factor for co-creation processes is clear and transparent communication. Therefore, it is essential to establish common communication rules at the beginning of the process that promote open and honest exchange. These rules define how we interact with each other, what expectations we have of those involved, and how we create a climate of trust together.

At the beginning of the workshops were therefore agreed with participants on the following communication principles:

- Be yourself! We want to know what you think! We value your unique perspective and encourage you to authentically contribute your thoughts and ideas. Don't try to tell us what you think we want to hear—your honest opinion is valuable.
- We want to hear your opinion. There are no wrong answers or stupid questions. Every contribution is welcome and important. Don't be afraid to share your thoughts or ask questions, even if they seem insignificant at first.

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<sup>1</sup> Prahalad, C.K.; Ramaswamy, V. (2004). [The Future of Competition](#). Harvard Business School Press. pp. 8. ISBN 1-57851-953-5.

- Do not judge others' ideas, opinions, or feelings, but respect the diversity of perspectives. Ask clarifying questions to build understanding, but avoid trying to convince others of your view. Always provide honest yet constructive feedback. Use "What if" questions to stimulate new thinking, rather than responding with a dismissive "yes, but."
- Some things are confidential. We may share sensitive information throughout the process. It's important that we all recognize and respect the confidentiality of certain content.
- Let us know if you feel uncomfortable with something. Your well-being is important to us. If there are topics that make you feel uncomfortable or have concerns, please speak up.

We communicated these principles after people got to know each other, and a first base of trust was already established.

## 2.2 Design Thinking

When designing a new product or service it is crucial to understand the users' challenge you try to solve and if the product or service that is being developed provides an answer to this challenge. Design thinking helps to do this in a fast, flexible and efficient way within five different stages which are explained below, each with a specific goal. The basic principle within this methodology is to put the user first.

Within this methodology, the involved stakeholders are considered partners that are experts in their own situation and needs. They are not study objects, which can be the approach in classical innovation processes.

Key features of design thinking include those challenges are considered from different perspectives, that it is iterative and interactive, and assumptions should be recognized and challenged.

The stages of Design Thinking are defined as follows:

1. Empathize: Understanding user needs and contexts.
2. Define: Making the problem statement(s) concrete.
3. Ideate: Generating creative solutions.
4. Prototype: Creating tangible representations of solutions.
5. Test: Gathering feedback and refining the solution.

During our workshops, we followed this approach and the stages of Design Thinking while also taking the principles of the Co-Creation approach into account.

### 3. Report on study visit in Belgium

This section describes the two-day study visit in Kortrijk, Belgium, which aimed to develop innovative solutions for data management challenges in partner projects together with various stakeholders.

**Day 1** introduced participants to data management challenges through visits to Living Labs Sirris and Veg-i-Tec. After setting the scene with the SIXFOLD project and SS4AF partnership outline, participants were introduced to co-creation approaches. The day focused on identifying barriers using the "5 Whys" method, prioritizing them with "Impact-Effort" analysis, and reformulating challenges into solution-oriented "How Might We" questions. The day concluded with reverse brainstorming, dot voting, prioritization, and initial plenary presentations.

**Day 2** began with a reflection on Day 1 outcomes. Participants formed interest-based groups to deepen problem understanding using problem-solution canvases, followed by plenary presentations. The workshop concluded with commitment circle exercises to define concrete next steps, followed by a visit to the Flanders Make Living Lab.

## 3.1 Visits to the Living Labs

### 3.1.1 VEG-i-TEC

VEG-i-Tec provides pilot infrastructure and scientific expertise to the vegetable and potato processing industry to drive innovation. This way, they bridge academic research with industrial practice, focusing on product and process optimization, 'Smart Food' applications, circularity, and sustainable water management. In doing so, VEG-i-TEC supports efficient resource use, by-product valorisation, and innovative solutions for a sustainable future.



**FIGURE 3: SIXFOLD STUDY VISIT PARTICIPANTS VISIT THE VEG-I-TEC LIVING LAB IN BELGIUM.**

### 3.1.2 Sirris

Sirris is situated in the House of Manufacturing on Kortrijk Campus. It has installed the 'Industry 4.0 Made Real Experience Center' with a focus on 'smart assembly'. In this lab, companies can gain hands-on experience with the latest smart assembly technologies and test new ideas, and collaborate in co-creation with the expertise and guidance of the other research labs.



**FIGURE 4: SIXFOLD STUDY VISIT PARTICIPANTS VISIT THE SIRRIS LIVING LAB IN BELGIUM.**

### 3.1.3 Flanders Make

Flanders Make is a co-creation center to help companies transition to smart, digital factories with cutting-edge Industry 4.0 technologies. The focus is on digital twins, smart robotics, and automation, with a central place for the operator.



**FIGURE 5: SIXFOLD STUDY VISIT PARTICIPANTS VISIT THE FLANDERS MAKE LIVING LAB IN BELGIUM.**

## 3.2 Workshop Session Day 1 of the study visit in Belgium

### 3.2.1 Summary

After setting the scene, participants were introduced to the co-creation approach and communication rules.

Following this, barriers and problems in data management were identified in 3 small groups using the "5 Whys" method. These problems were then prioritized using the "Impact-Effort" method and reformulated into solution-oriented "How Might We" questions.

The day concluded with a brainstorming of potential solutions (reverse brainstorming), prioritization through dot voting, and an initial presentation of the most promising ideas to the plenary.

After the first day, Workshop moderators gathered to select suitable ideas and methods to proceed on day 2.



**FIGURE 6: PARTICIPANTS OF THE FIRST SIXFOLD STUDY VISITS IN BELGIUM.**

### 3.2.2 Empathize, Define, and Frame the problem

These phases were done separately in three small groups. Stated below is a summary of the outcome. The group discussions highlighted different viewpoints for companies (especially SMEs) and living labs.

The outcome of each group is summarized in Annex 1.

#### **For Companies/ especially SMEs:**

Participants identified several major challenges from a company viewpoint:

**Lack of a Coherent Data Strategy:** A significant challenge is the absence of a clear data strategy at the company level. This issue affects a wide range of internal and external stakeholders, including:

- Internal: IT departments, management, sales teams, operations staff, and HR.
- External: Living Labs, government bodies, industry associations, suppliers, and buyers.
- The impact of this strategic gap is felt in key areas such as food safety, cybersecurity compliance, and meeting demand from large retail partners.
- Ultimately, it hinders core business processes, negatively impacts efficiency and reputation, and obstructs strategic goals like growth, funding, sustainability, and the twin transition (green and digital).

**Building the Right Infrastructure:** Constructing adequate infrastructure for data capture presents a major hurdle. This requires significant investment in knowledge, financial resources, time, and skilled personnel. A clear vision for return on investment is essential, as is the need for specialists who can translate between disciplines like data science and food technology. The lack of clear roadmaps for digitalization exacerbates this challenge.

**Communication Gaps:** Effective communication about data is a common barrier. Differences in personalities, professional backgrounds, and departmental languages (e.g., between IT and other units) can lead to misunderstandings. This often results in an inability to plan holistically, leading to unsatisfactory outcomes, unfinished products, and costly, unplanned iterative cycles.

**Reluctance to Change:** Resistance to change within organizations is a significant factor. This is driven by the rapid pace of innovation, which can make technology feel outdated quickly, uncertain results from cost-benefit analyses, and employee apprehensions rooted in fear of new processes, mistrust, and concerns about making mistakes.

**Data Sharing:** Multiple difficulties surround the sharing of data. These include the sheer volume of untapped data, a lack of trust stemming from fears over losing competitive advantage, technically complex and error-prone transfer processes, and legal uncertainties regarding data release and protection regulations.

**Data Utilization and Visualization:** Transforming data into actionable insights is a key challenge. Problems include the unavailability or poor formatting of relevant data, the significant effort required to make raw data accessible and appealing, and inefficient processes caused by varying data formats and skill levels. Many stakeholders get lost in a “data jungle” due to a lack of user-friendly information presentation.

### **For Living Labs**

From the Living Lab point of view, adding to the issues above, the following aspects were seen as major when thinking about data and its challenges:

A main problem lies in the measurement of criteria: Participants observe that essential, intangible success factors—such as the perceived profitability and usefulness of a solution, or the knowledge gained and the sharing of ideas and inspiration—are typically not quantifiable metrics that formally contribute to the overall success evaluation of the Living Lab.

Furthermore, significant collaboration difficulties arise, especially concerning data sharing among different parties:

- Legal concerns may frequently impede the necessary data exchange (data sharing issues).
- The Living Lab is sometimes perceived as not important enough to warrant the sharing of sensitive company data.
- It is crucial that the data originator maintains access to their data.
- At its core, data sharing in collaborative projects is a major challenge because companies fear losing knowledge and the exchange demands a high level of trust among all collaborating partners.

### 3.2.3 Problem Framing

Within this phase, the identified problem areas were narrowed down to concrete issues. Using “How Might We” questions, impact-effort matrices, and dot voting, participants selected key challenges to tackle:

**Strategy for Digitalization:** One group emphasized that the main problem for many companies and Living Labs is the lack of a strategy for digitalization and data usage, which results in inaction. This omission not only harms business and innovation opportunities but also directly affects critical areas such as food safety and cybersecurity, impacting all major business functions. The underlying structural hurdles identified included: the fear of starting because the problem is perceived as too big to handle, lacking skills among company employees, a corporate strategy not designed for data management, and the deterrent effect of high necessary investments.

**Roadmap for DaaS in Living Labs:** A second group focused on creating a Roadmap for Data Sharing and "Digitalization as a Service" (DaaS) activities within Living Labs. A primary concern identified was the lack of knowledge regarding data sharing and digitalization, both internally and in collaboration with partners. This led to the core questions: How might we raise awareness among companies/Living Labs about the specific potential benefits of digitalization, and how might we address the lack of digitalization vision in both companies and Living Labs? While emphasizing the importance of a long-term strategy, the group stressed that users must not be overwhelmed by the overall plan. An ideal concept should therefore enable small steps with clearly defined expenses and empathically guide users along their path toward digitalization.

**From Data to Actionable Information:** The third group worked with the step from data to actionable information and digitalization as a service activities with a special emphasis on data visualization.

The participants have the costs and key performance indicators for central parameters in the context of data visualization:

- The Costs associated with Cooperation among SMEs, Living Labs (LLs), and Research were defined as Knowledge, with SME Competencies serving as the corresponding Key Metric.
- The cost of a Case Study was primarily considered Personnel, with the Skill Set of Employees being the relevant Key Metric.
- The Costs for implementing DaaS (Digitalization as a Service) were viewed as Technology Doubts (RISKS), while the Usability of Data was identified as the crucial Key Metric.
- The overarching strategy emphasized starting small and modular, with Return on Investment (ROI) as the decisive Key Metric.
- Further expansion and scaling should be driven by convincing the board and securing grant vouchers for SMEs and LLs.

In the following plenary session, participants discovered a lot of similarities in their group approaches. For example, the human factor with a fear of starting data sharing and digitalization and reluctance to change was described in all groups as a crucial barrier for all digitalization activities.

Due to the heterogenous group composition, groups stressed on different users. Whereas some saw SME as the main actors and users, others regarded Living Lab personnel as main user.

All groups agreed on the necessity of strategy for digitalization as the most important step. This needs to be well defined and understandable, as well as portion able as to fit many sizes.

### **3.2.4 Reflection on day 1**

Following the first day's workshop, the moderators met to reflect on the content and set the framework for the second day. Building on the plenary session's reflections, it was agreed that the participants would focus on three main topics and would work in new, self-defined groups. Regarding time management, the moderators decided to focus the next day's work on the "Problem Solution Canvas" to avoid overloading the programme and to ensure sufficient time for valuable discussions. The overarching goal of this structure was to steer the groups toward establishing concrete commitments for future cooperation concerning the topics addressed.

### **3.3. Workshop Session Day 2 of the study visit in Belgium**

#### **3.3.1 Empathize Part 2 and Prototype – Making Concepts Tangible**

On day 2, participants started the workshop session with a short recap of day 1 and a small energizer, where the participants had to deliver a two-word takeaway for day 1. Some of the words mentioned here were: inspiring, intense, co-creative, innovative, networking, impressive, and Living Lab.

Participants were then informed about the three potential topics and the further plan for the day. The group moderators and co-moderators were then assigned, and people could decide to join the group they were most interested in.

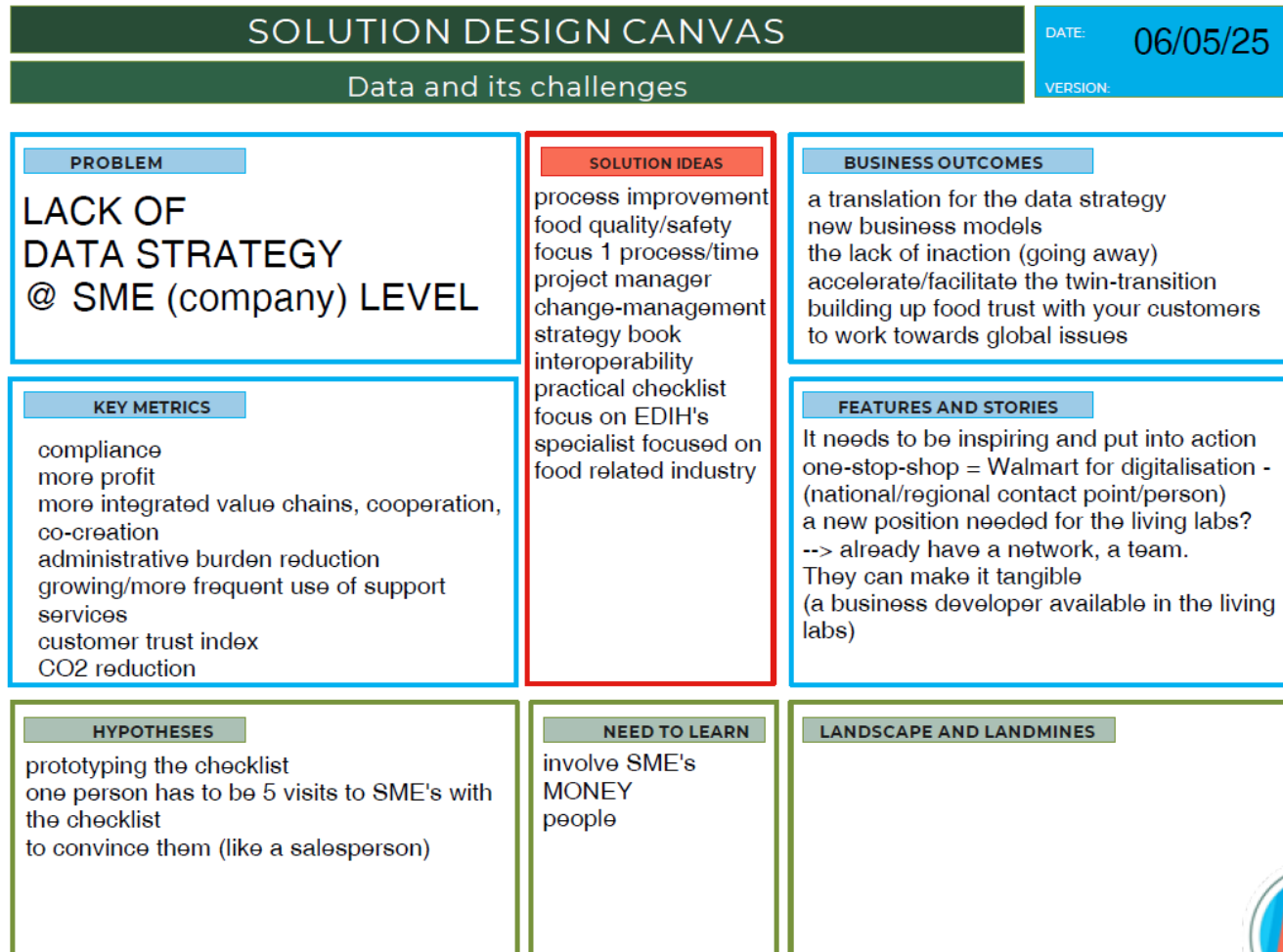
In the groups, participants decided to adjust the topics to reflect the process better.

#### **3.3.2 Strategy for digitalization in foodtech SMEs**

This group focused on a plan of action designed to achieve a long term or overall aim. The group focused on the central problem of a lack of data strategy in many companies, especially SME. The aim was to provide a plan to guide SMEs through the “Data jungle”.

A teaser for the group can be described as “Regulation is coming, are you prepared?”. The solution should be inspiring for SME and also put them to action. For this, the solution should be able to quickly show or demonstrate results rather than be based on just words as this is more convincing. Ideas that could be presented to SMEs should thus be tangible solutions that clearly state what to measure and include a proof of concept. The overall solution should include a plan for various levels of digitalization and show SMEs how to take concrete steps towards achieving their goals, taking a lean and mean approach especially for interoperability.

A human-centered approach and a level of trust for talking to participants was also seen to be very important. The solution should be worked on with already existing groups and support services such as EDIH or SS4AF, as creating a new food tech initiative would be like planting a new tree in the already existing jungle and even more confusing to companies.



Modified version of the "Solution Design Canvas." Original licensed under Creative Commons Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0). Available at: <https://miro.com/app/board/uXjVKY-c9eM/>



**FIGURE 7: CANVAS FOR “STRATEGY FOR DIGITALIZATION IN FOODTECH SMES”.**

### **3.3.3 Digitalization as a Service in Living Labs (DaaS)**

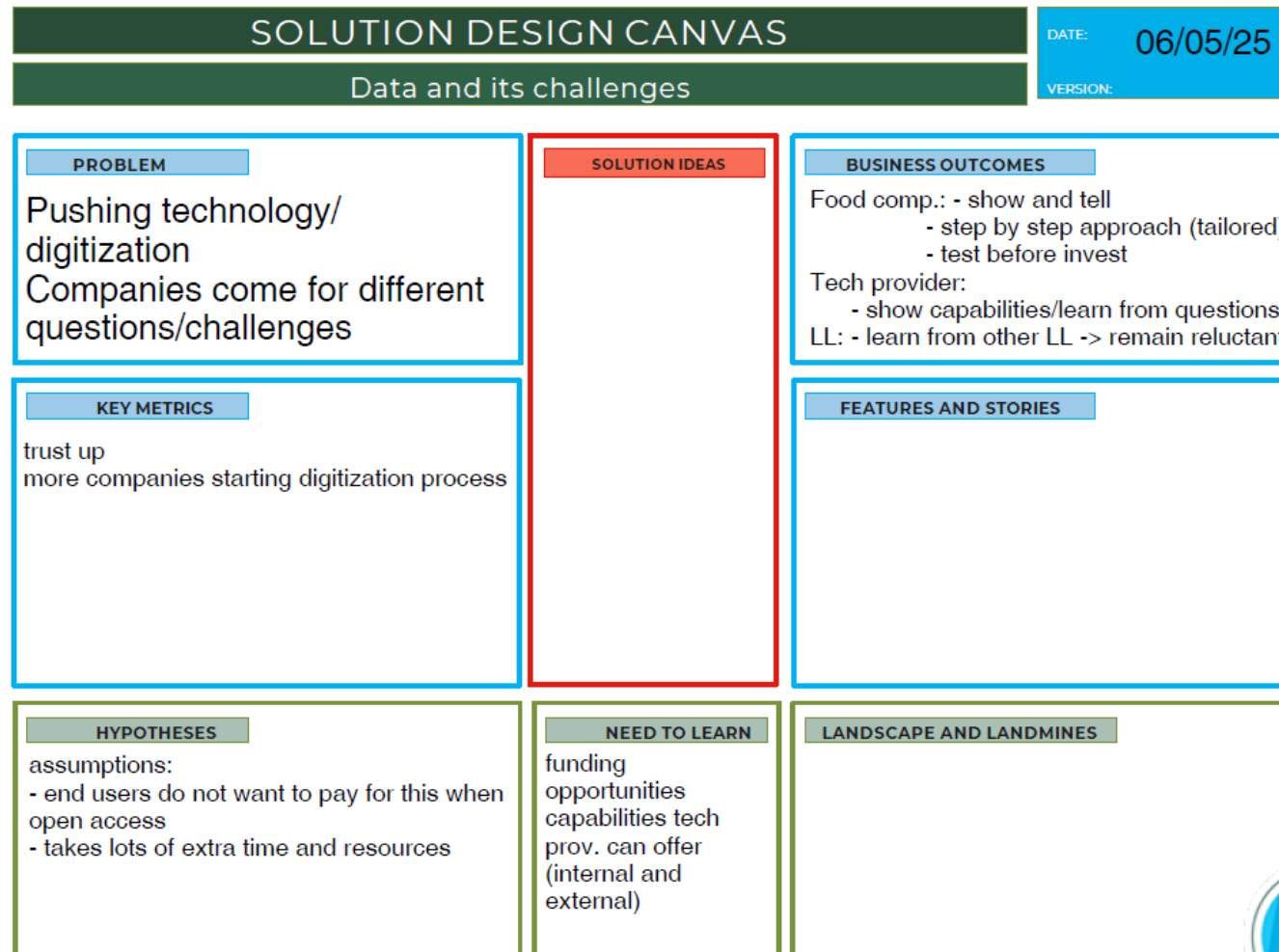
After adjusting the topic in after a brief group discussion, this group focused on the problem that companies coming to Food oriented Living Labs often come for a different question than digitalization. However, it was agreed that in many cases, digitalization can often close a significant knowledge gap and add great value to a possible solution.

The aim is therefore to add digitalization as an extra layer to a project. It is important to show a step-by-step approach to lower the barrier and start with an easy step. Participants pointed out that Living Labs can serve as a reference with tests and test cases so it is significant to make them fit for the purpose with state-of-the-art technology and approaches.

On the company's side there is a high need of security especially when data use is involved. A problem is also the fact that the more services are offered, the more expensive a project will be and the more time it will take. Living Labs should thus be informed about possibilities for companies to use innovation vouchers and other financing options.

It was further pointed out to be important that different Living Labs with varying scopes work together to obtain best results and evolve quicker.

By talking through a real-life example from a company that came to a participating Living Lab for product development, participants worked through the discussed framework. It became clear, that the prerequisites and needs are different each time and Living Labs should not restrict themselves too much by offering just one possibility of working together but be open to different approaches.



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**FIGURE 8: CANVAS FOR “DIGITALIZATION AS A SERVICE IN LIVING LABS”.**

### 3.3.4 Data visualization: From data to actionable information

The newly formed workshop group dedicated its efforts to the barrier case of data visualization, identified on the preceding day and operating under the guiding principle: "Form Data to Actionable Information."

Following a comprehensive revisit of the topic and a detailed analysis of the extant difficulties, a series of central challenges and points of discussion emerged:

- In the realm of data visualization, the risk of misinterpretation was identified as a significant problem. An unsuitable or misleading representation of data can rapidly lead to an incorrect understanding of complex issues. Closely linked to this is the problem of data transfer. Errors or inconsistencies during data transmission can considerably impair the quality of the visualization, consequently leading to erroneous conclusions.
- Another central question concerned the relevance of the data: Which data are truly meaningful and required for visualization to generate genuine added value? In this context, the importance of metadata was also underscored, as it is indispensable for understanding the context and quality of the visualized information.
- From a business perspective, the initial investment in tools and training for data visualization was frequently cited as a hurdle, as the immediate benefits are not always readily apparent. Furthermore, concerns regarding data security certification play a crucial role, particularly when dealing with sensitive company data.
- The upstream processes of data acquisition, documentation, and transcription were also identified as potential sources of error that can be reflected in the visualization. To address these challenges, the development of a template for needs analysis was deemed sensible to clearly define which data are relevant for specific inquiries.
- The difficulty in finding a common data language and connecting different data sources presented another important point of discussion. Different formats and terminologies complicate the integration and overarching analysis of data.

Subsequent to this problem analysis, the creation of a template was developed as a promising solution approach. Using the question "How to read time series data?" as an example, a Solution Design Canvas was created to develop a concrete visual solution.

As a result of these efforts, a concept for the visual representation of time series data emerged, utilizing two types of diagrams. In both diagrams, the x-axis represents the time progression, while the y-axis represents a quantitative value, such as temperature or energy consumption.

The first diagram visualizes critical threshold values. An upper and a lower limit define a tolerance range, while a center line represents the average value.

Should the measured time series exceed the upper or lower limit, this is interpreted as an indicator of a necessary action.

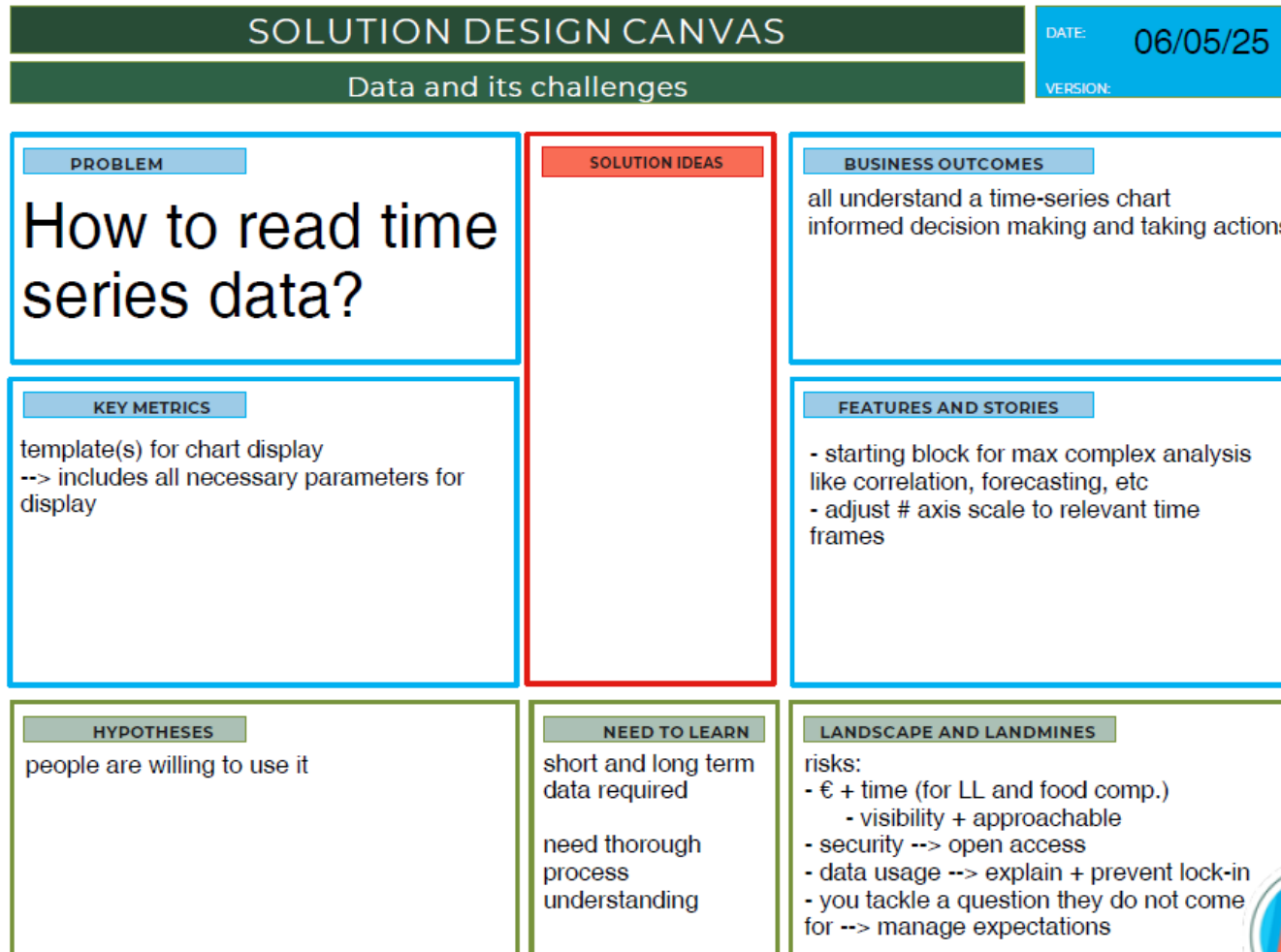
The second diagram offers a more differentiated analysis by comparing different time periods. A short-term line shows the current measurement in relation to the measurements of the last few days or weeks. A significant deviation of the current measurement from this short-term trend can be a signal for the responsible employee that an intervention may be required. Additionally, the long-term line visualizes the current measurement in comparison to the measurements of the last few years. This long-term perspective can provide management with important insights into structural changes or trends that may necessitate measures for future cost reduction.

In summary, the developed solution demonstrates, in a simplified and intuitive manner, how data can be visually prepared to make them quickly and easily accessible, thereby establishing a foundation for more informed decision-making.

As a primary concrete action, the creation of an informative handout was decided upon, which summarizes the key findings and potential solution approaches, making them accessible to a wider audience. Furthermore, a strong interest in initiating a follow-up project was expressed. This project could, for instance, focus on the development and testing of practice-oriented templates for effective data visualizations, thereby facilitating practical application within the business context and making a direct contribution to the improvement of data comprehensibility and utilization.



**FIGURE 9: GROUP 3 DISCUSSION AT THE SIXFOLD STUDY VISIT IN BELGIUM.**



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**FIGURE 10: CANVAS FOR “DATA VISUALIZATION: FROM DATA TO ACTIONABLE INFORMATION”.**

### 3.3.5 Test & Feedback and Plenary Session

After the group sessions, the results were shared in the plenary for further discussion and feedback. Participants were also encouraged to commit to developing the solutions further.

- **Group 1 (Strategy for SMEs):** The discussion focused on how to make digitalization plans less overwhelming for SMEs. Suggestions included Living Labs taking a guiding role, offering quick “Digi scans,” and training “Digitalization Business Developers” within Living Labs.
- **Group 2 (DaaS in LLs):** The discussion explored how Living Labs see the DaaS approach, noting that their purposes can differ (e.g., education-focused vs. industry-service-focused), which affects how data management is integrated.
- **Group 3 (Data Visualization):** The simple, intuitive visualization example was well-received. Participants saw its potential as a tool to be used in Living Labs to demonstrate the possibilities of data and digitalization.

### 3.3.6 Commitment circle

#### Group 1: Strategy for digitalization in foodtech SMEs

Participants agreed to scan similar approaches that already exist and check what is feasible and less feasible of these existing solutions.

Next, Living Labs will be encouraged to do some testing with stakeholders.

#### Group 2: Digitalization as a Service in Living Labs

There were some discussions on what could be the next step for the group. Participants agreed on looking at the add-on feature of digitalization which supports other Living Lab services (e. g. product development) and reflect this also with collaborating SMEs. Also, the group wants to promoting or convincing the people of the four LL that are more closely attached to the project now to think about what they have and how they can incorporate a digital service.

Creating a closer contact between the LL and a sharing of experiences should also be a next step.

#### Group 3: From data to actionable information

An easy visualization tool that can be modified according to the specific data needs is to be developed by group members. It will then be showcased what it can do and bring.

Living Labs are further encouraged to take part in this development process.

There is a plan to write a short blog article about this topic.

### 3.4 Results of the survey

A survey was done via an online tool to ask participants anonymously about their perception of the study visit overall and of specific aspects.

The full results can be seen in Annex 2.

Not all participants took part in the survey. Of the 11 participants who answered the questions, most were project partners or part of the participating cluster organisations (81%). 20% were integrators or tech and digital solution providers. Most people were project or program managers.

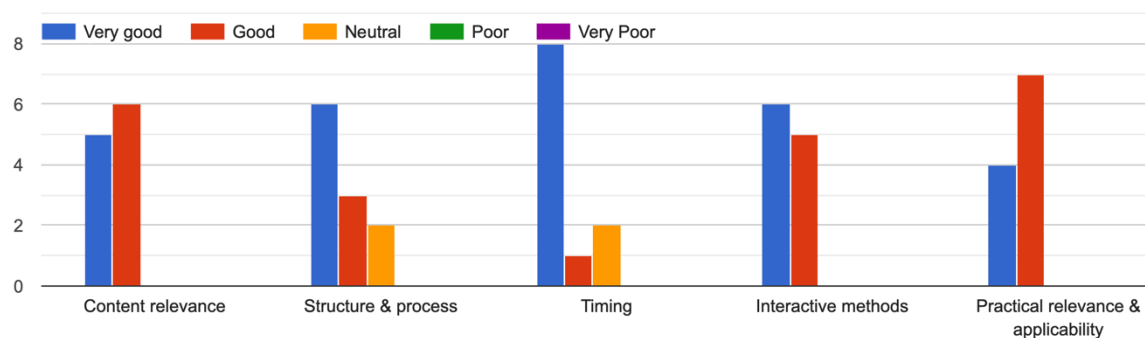
Concerning the overall perception, most people ranked the study visit as very good (64%) or good (36%) on a scale from very good to very poor. Overall organisation was ranked the same.

The information provided in advance was seen as sufficient to most people (73% yes, 27% partly). Considering the visited Living Labs, most participants ranked them as very suitable (82%) or suitable (18%).

The workshops met people's expectations (82% yes and 18% partially).

Different aspects of the workshops were ranked differently, with structure and process and practical relevance as well and content relevance being good on a scale from very good to very poor.

How would you rate the following aspects of the workshops?



**FIGURE 11: RESULTS FOR THE QUESTION "HOW WOULD YOU RATE THE FOLLOWING ASPECTS OF THE WORKSHOP?"**

Participants found the individual workshop phases to be very helpful to helpful. There were mixed opinions on the co-creation methodology, which ranked from very good (64%) to good (36%).

Reverse brainstorming and the problem solution canvas were seen to be especially helpful to participants. All participants would attend similar workshops in the future.

**Participants provided detailed feedback on various aspects of the event:**

- **Positive Experiences:** Respondents frequently highlighted the positive atmosphere, valuable networking, and inspiration gained from the Living Lab visits and expert interactions. The group discussions and brainstorming sessions were particularly appreciated. The opportunity to learn about regional needs and brainstorm solutions freely was seen as a major benefit.
- **Valuable Insights from Living Labs:** The hands-on insights into different Living Labs were considered highly valuable. Participants gained practical knowledge on topics such as setting up data sources, implementing digital twins, and understanding the management and service models of various labs. Learning about common and different approaches across regions was especially useful.
- **Useful Workshop Methods:** The individual workshop phases were found to be helpful. Specific methods like reverse brainstorming and the problem-solution canvas were singled out as particularly effective. All respondents expressed interest in attending similar workshops in the future.

**Areas for Improvement and Suggestions:**

While satisfaction was high, participants offered constructive suggestions to enhance future events:

- **Programme Density:** The primary feedback was to reduce the intensity and density of the programme, allowing for more time to reflect, digest information, and network.
- **Pre-Workshop Information:** Providing more detailed information about fellow attendees and their organizations beforehand was suggested to improve networking and context.
- **Workshop Focus:** For the co-creation sessions, suggestions included providing a smaller selection of pre-defined, concrete problems to solve and handing out contextual documents to create a common starting point for all participants.
- **Participant Composition:** There were contrasting views on participant focus. Some suggested inviting more SME representatives to better understand their needs, while others recommended a stronger focus on how Living Labs themselves can be improved.

**Key Takeaways and Future Applications:**

Participants confirmed they would apply the insights gained in their work. The brainstorming tools and canvas methodologies were frequently mentioned, along with the newly gained perspectives on common challenges. The importance of involving all stakeholders in solution development was a key learning.

When asked about specific concepts to pursue further, respondents identified several areas:

- Digitalization as a Service (DaaS)
- Strategy development for Living Lab data management
- The Problem-Solution Canvas method
- Creating ecosystems within Living Labs
- Increasing awareness of the “twin transition” (green and digital) for businesses

### **3.5 Conclusion after the study visit**

After the first study visit, some gleanings were collected for the further development of the next study visits.

With respect to the results of the survey that was handed out to all participants, as well as in agreement with the project group, the following points were addressed and changed to react according to the feedback:

- In general, less working time for one day was planned, and more time was given to networking, time to think, and the creation of a trustworthy atmosphere between participants.
- More time was calculated for the workshop sessions on the study visits
- Sessions are planned more concisely, and methods are reduced and adapted accordingly to give participants more room to think and discuss without overwhelming them
- Topics were narrowed down beforehand to get a clearer view of a possible outcome
- The feedback loop was adjusted in a simpler and more anonymous tool to get feedback from more participants.

In general, study visit 1 in Belgium and study visit 2 in Finland differ a lot already in the prerequisites. Whereas Kortrijk Campus in Belgium is home to multiple organisations and Living Labs are hosted by different institutions, the Seinäjoki Campus Frami Food Living Lab is the only food and tech-related Living Lab in the less populated area and is hosted by the Seinäjoki University of Applied Sciences.

## 4. Report on study visit in Finland

This part describes a two-day workshop aimed at developing innovative solutions to novel food regulatory and social acceptance challenges specifically precise fermentation products and how can living labs assist with these challenges.

### Day 1

The 1<sup>st</sup> Day introduced participants to the co-creation approach, with a particular focus on the “empathize” and “define” steps in the context of precision fermentation. It also explored how Living Labs could support solutions to challenges related to regulation and social acceptance.

The day began with shared framing and an emphasis on the theme, followed by a keynote speech on cellular agriculture and its regulatory aspects, and the establishment of collaborative workshop norms.

Participants then divided into pre-assigned groups **A** and **B**.

**A** group continued workshopping in booths and **B** group goes to SEAMK FoodTec to experience extrusion showcase of High-Moisture extrusion using Hemp Protein.

A group participants divided into pre-assigned groups (1, 2 and 3) and began workshopping in booths to define how living labs could support overcoming challenges related to precision fermentation regulation and social acceptance.

During the first 45 minutes, each group focused on regulatory challenges, working with two canvases: the first for user stories and stakeholder mapping, and the second for challenge mapping. After 45 minutes, the groups switched topics and repeated the process, now focusing on social acceptance challenges using the same two types of canvases. These canvas methods helped participants dig deeper into real-world problems and explore how they might be addressed through Living Lab approaches.

Groups **A** and **B** then switch activities after the lunch break.

Day 1 ended with plenary discussion and final reflection where each group’s canvases are showcased on the auditorium stage. Groups presented their findings briefly in the plenary. This was followed by an open discussion to deepen shared understanding.

Participants got the chance to vote on the most important topics with green and red post-it dots directly on the canvases displayed. Top-voted topics were selected as input for Day 2’s ideation. Moderators synthesized overlapping topics and merge related topics.

Final reflections included shared feelings and insights after the 1<sup>st</sup> Day, quick discussion with nearby participants about the day and lastly introduction to Day 2.

Day 1 ended with a networking dinner and a brewery tour.

### Day 2

The 2<sup>nd</sup> Day focuses on ideation, prototyping, and testing. The day starts with the opening of the day and introduction to workshop session 2.

After the opening, all participants engage in an ideation activity focused on identifying challenges related to precision fermentation regulation and social acceptance that Living Labs could help address.

The method used is 1-2-4-All: participants first ideate individually, then in pairs, and finally in groups of four. Each group then selects and presents their two best ideas, one related to regulation and one to social acceptance.

Afterward, the whole group reviews and discusses the selected ideas together. The insights and outputs from this activity are then used in the later workshop booth sessions.

After the ideation phase, participants move together to the SEAMK FoodLab, where they experience the Spray Dryer Showcase and Membrane Filtration Showcase, and hear a presentation about the Future Frami Food Lab project and the SEAMK FoodLab concept.

Following the showcase, participants return to the auditorium and then divide into their pre-assigned groups (1, 2, 3, 4) before moving to their designated working booths.

In the booths, each group works with problem-solving canvases, drawing on outputs from Day 1 and the morning ideation session. 1 full Problem-Solving Canvas has 8 headings; these headings are split into separate canvases. Each group completes two full canvases:

- One addressing regulatory challenges related to precision fermentation (45 minutes)
- One focused on social acceptance challenges related to precision fermentation (45 minutes)

Following the booth work, all participants return to the auditorium. Each group or group moderator presents their canvases and proposed solutions. This is followed by a Q&A session, cross-group discussion on the ideas presented, and a collaborative conversation on commitment and next steps for the most relevant solutions.

The day concludes with a wrap-up session, where the facilitator summarizes key learnings, lessons, and introduces upcoming SIXFOLD events.

Finally, the second day and the workshop conclude with a networking BBQ event.

## **4.1 Workshop Session Day 1 of the study visit in Finland**

### **4.1.1 Introduction & Context: Setting the Scene and emphasize**

The morning focused on introducing participants to the challenges in novel food regulations. First, the premises of SEAMK, the hosting university, were introduced and a quick overview of the programme was given.

### **4.1.2 Empathize: Keynote speech on Cell Agriculture**

In this section, participants hear a keynote speech on Cell Agriculture and its regulation and social acceptance from professors Kaisu Riihinen and Anneli Ritala who are experts on cellular agriculture and regulation at VTT, which is the largest research and technology company and research centre conducting applied research in Finland. After participants got acquainted with each other and were divided into the different working groups, the different sessions started.

### **4.1.3 Empathize: Extrusion Showcase at the SEAMK Food Lab**

Whereas some groups started the workshops with the development of a problem statement, the other group had the chance to empathize by getting a hands-on experience with state-of-the-art extrusion technology at the SEAMK Frami Food Lab. In the afternoon, groups changed accordingly. The workshop groups mapped user insights, stakeholder perspectives and challenges with precision farming related to the following topics: Stakeholders and user stories, key challenges in regulation and social acceptance.

In Conclusion, participants discussed results in the plenary session and decided which topics they wanted to work on further on day 2.

#### **SEAMK Food Labs**

SEAMK Food Labs is a trailblazer in the food region, serving as a platform for education, research, and pilot projects in food production development. Food production is in the middle of a transformation. Changes and new approaches are needed across the industry when increasing the sustainability of food production. This adjustment demands a comprehensive understanding of the entire food chain and solutions that take inter-sectoral relations into account. This is where SEAMK's expertise comes in, SEAMK Food Labs provide modern laboratory environment where sustainable food solutions can be tested and piloted.

The laboratory agenda introduced participants to the topic of Extrusion. The core focus was the Demonstration of High-Moisture Extrusion Using Hemp Protein. Complementary to this, attendees were informed about the basics of the process, specifically what Extrusion is, the principles of the process, and its applications in the food industry, including plant-based meats, snacks, and texture modification.



**FIGURE 12: SHOWCASING EXTRUSION AT SEAMK FOOD LAB.**

#### **4.1.4 Define: User story mapping & Challenge mapping**

During a workshop session, participants were invited to map user stories as well as challenges in order to define the problem.

##### **The User stories & Stakeholders**

Participants were invited to reflect on the following key areas:

1. **User Pain Points/User Stories:** The central question here was where Living Labs could be used in a real-life context. Participants were asked to describe situations or experiences where Precision Fermentation causes confusion, conflict, or friction.
2. **Stakeholder Stories/Actor Mapping:** This section focused on identifying who the people or groups involved in or affected by these situations are. The task was to map the key actors (e.g., consumers, regulators, Start-ups, retailers, media, etc.).

### **Key challenges in Regulation & Social acceptance canvas**

This activity centered on filling the canvas with three central topics to transform identified problems into opportunity-focused questions.

Filling the Canvas: Key Topics

- **Regulatory Challenges on Novel Foods:** This involved pinpointing aspects of regulation seen as unclear, outdated, or difficult to navigate, specifically identifying concrete bottlenecks, uncertainties, or missing frameworks.
- **Social Acceptance Issues on Novel Foods:** The discussion focused on the question, "What concerns, resistance, or misunderstandings arise around Precision Fermentation (PF)?", considering aspects like trust, ethics, transparency, and communication.
- **Connection to Living Labs:** The aim was to explore how these challenges might be explored, tested, or improved through Living Lab methods, highlighting opportunities for user involvement or co-creation.

### **From Problems to Possibilities: "How Might We" (HMW) Questions**

In this key phase of the innovation process, the goal is to convert identified problems into opportunity-focused questions. Instead of highlighting what is missing, the so-called "How Might We" (HMW) questions shift the focus toward possible solutions and spark creative thinking. Each HMW question typically starts with the phrase "How might we...". This approach offers several benefits: it challenges old thinking by helping teams move beyond usual ideas; it boosts creativity due to its open format; it stays focused on the main problem without limiting creativity; it encourages optimism by suggesting that a solution is possible; and finally, it allows for the exploration of many options, as a well-phrased question opens different ways to solve the problem.

### **4.1.5 Results of the workshops**

Following a brief introduction of the participants, the workshop rules, and the methodology, attendees engaged in an intensive discussion about Precision Fermentation (PF), its opportunities, and the associated conflicts and challenges.

#### **Key Challenges of Precision Fermentation**

##### **Regulation and Governance**

Several critical points were identified here:

- **Lobbying:** There is a lack of a strong lobby for PF, while powerful opposing lobbies exist from the meat industry and anti-GMO groups.
- **Regulatory Hurdles:** There is a lack of a regulatory "sandbox"; innovation and testing face risk-averse regulation, which lags behind technological development.
- **Legal Ambiguity:** Standardized processes and legislation are missing.
- **Lack of Information:** There is a shortage of expert advice available to bring new products to market.
- **Long EU approval phases and funding discontinuity,** as Living Labs often struggle to survive after EU project funding ends without further subsidies.

##### **Role of Local Governments**

For local decision-makers, the following aspects emerged:

- **Lack of Support:** Traditional agriculture is subsidized, but there is virtually no support for PF start-ups yet.
- **Influence of Local Levels:** Local and regional governments can play an important role by conveying the concerns of agriculture, which is a primarily local sector, to national and European authorities.

##### **Scientists and Technologists**

The central problem here is Brain Drain, as specialists and scientists migrate to easier, more regulation-friendly environments, leading to a loss of knowledge.

## Consumers

The consumer discussion revolved around:

- Price: This is a significant deciding factor.
- Conservatism and Education: Consumers are more conservative; there is a high need to educate consumers, as "we don't accept what we don't know."
- Time Aspect: It takes time to change minds, which must be supported by education.
- Long-term safety of the product.

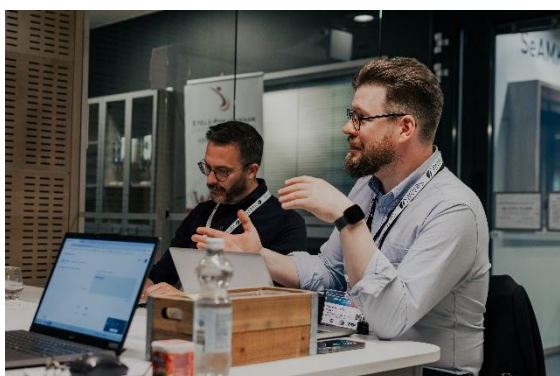
## B2B Industry

B2B actors focused on the price-volume dilemma: The price of the product is directly linked to the volume of production, as PF is not yet produced in large quantities.

## User Stories & Stakeholder Activity

Subsequently, participants developed user stories centered on the identified stakeholders, resulting in several core themes:

- Awareness/Education: Real case studies and education from a young age are crucial for building acceptance.
- Location Attractiveness: The question of why Start-ups go abroad highlights regulatory hurdles.
- Farmers' Need for Advice: Farmers/producers often do not know who can help them develop new products. Living Labs could serve as advisors and support providers here.
- Peer-to-Peer Advice: Exchange from producer to producer or farmer to farmer could enhance the movement, given that producers are reluctant to risk investments to "try out innovation."



**FIGURE 13: GROUP DISCUSSION AT THE STUDY VISIT IN FINLAND.**

## **The Role of Living Labs in Establishing Precision Fermentation**

The discussion illuminated both the limitations and the potential of Precision Fermentation (PF). The hypothetical question of what would happen without a regulatory framework showed that although economic efficiency would be easier to demonstrate, high demands for expensive fermenters, downstream processing, and a lack of experience would remain ongoing challenges. Even with regulatory changes, many factors like high investments, stable sales figures, and the lengthy time-to-market process would stay the same. The principle of "survival of the fittest" applies: the stronger the organization behind the innovation, the more likely it is to survive in the jungle of ingredients.

### **Living Labs' Contribution to PF Implementation**

Living Labs (LLs) can play a crucial role in accelerating PF implementation:

- **Research & Development (R&D):** Supporting scale-up, maximizing yield in downstream processing, improving taste, and meeting technical requirements.
- **Market and Business Development:** Providing marketing support, market understanding, and application support for sales to acquire customers (business development).
- **Networking & Coordination:** They serve as a meet-up place for all stakeholders to accelerate the scale-up process, and they link actors and investors.
- **Knowledge Transfer & Education:** LLs can inform regulators neutrally, offer training for both students and staff, and provide education for the general public.

### **Financial Challenges and Support**

Despite the potential, there is a pressing need for financial support. This could be created through business alliances where larger companies assist start-ups (creating win-win situations). Furthermore, specific projects and funding for Living Labs themselves, as well as alternative financing models, are necessary. Government aid is often difficult to secure because the problems and risks, unlike in other sectors, are not perceived as large enough (which could otherwise be viewed as company favouritism).

### **Next Steps for Living Labs**

LLs should join forces and connect in a network of LLs to develop business cases and legal support. The critical question of whether LLs give users what they want, instead of what they need must be addressed. Within the network, the sharing of ideas and experiences, as well as the sharing of information on failures, is important to avoid redundant work and offer services not yet provided by the network.

### **Solutions for Regulatory and Social Challenges**

LLs can specifically help by ensuring the management and organization of sustainable structures (independent of project money). Their task is to translate complex tech or policy concepts into accessible language, reduce misinformation, guide producers on where to go and how to implement new products, and provide an overview of pilot producers through a network. Central to their role is building trust in new products, storytelling, and organizing roundtables with stakeholders.

### **"How Might We" Questions for the Future**

- The activity culminated in solution-oriented "How Might We" (HMW) questions:
- How might we connect business and Living Labs?
- How might we create better incentives?
- How might we find funding for SME trials?
- How might we find/create better tools for funding?
- How might we create user stories and educate people to make them more open to innovation with respect to precision fermentation?



**FIGURE 14: WORKSHOP ATMOSPHERE AT THE STUDY VISIT IN FINLAND.**

### 4.1.6 Plenary discussion and Wrap-up of the day 1

Following the group work, each team presented their findings on the auditorium stage and giving a summary (5 minutes per group) focused on the elaborated user stories, key challenges, and relevant stakeholders. The flipcharts can be found in Annex 3.

A subsequent 30-minute plenary discussion helped to deepen shared understanding and identify the following overarching themes and insights:

#### Key Discussion Points

- **Regulatory Environment:** The urgent need for regulatory sandboxes to enable innovation was stressed.
- **Talent and Incentives:** Regulatory constraints lead to brain drain, as researchers and developers move to regions with easier regulations. Simultaneously, researcher incentives to collaborate with companies must be established.
- **Market Dynamics:** The principle of "survival of the fittest" often governs the market. It was noted that marketing should be integrated into the process from the start so that the narrative can be defined during development.
- **Learning and Collaboration:** Instead of just "failing fast," the goal should be learning fast. This involves avoiding "reinventing the wheel" by looking beyond borders and learning from global examples, such as the Singaporean chicken sandboxes, viewing them as opportunities, not competition. Participants should complement each other, not just on products, but also on aspects like testing panels, and work in multidisciplinary teams from the start.
- **Cultural and Communication Gaps:** Cultural differences were seen as both a blessing and a curse. The lack of a unified language among technical, regulatory, and scientific stakeholders necessitates good translation of complex concepts. The question of whether clinical trials for food are needed, similar to those for pharmaceuticals, was raised.
- **Education and Acceptance:** To break down prejudices and foster acceptance, the educational problem must be addressed by ensuring children come into contact with novel food from an early stage.
- **Role of the Living Lab:** LLs have a role in facilitating multidisciplinary teams and supporting the scaling phase.
- **Subsidies:** Subsidies can have a negative influence if there is no proper overview and if they are limited to specific, restrictive areas.

### Next Focus Topics

Based on these discussions, the groups agreed to continue their work in new, self-selected groups on the following key areas on day 2:

- User stories and stakeholders (for precision fermentation and fermentation in general)
- EU Network of Living Labs to support innovation in precision fermentation
- Addressing key challenges in acceptance and regulatory issues
- Knowledge Transfer for precision fermentation for Living Labs

In conclusion, the participants praised the workshop as both very intensive and very productive. The mix of practical considerations of the topic and fruitful discussions was particularly well-balanced. The day was rounded off in the evening with a brewery tour.



**FIGURE 15: BREWERY TOUR FOLLOWED BY TASTING.**

## 4.2 Workshop Session Day 2 of the study visit in Finland

### 4.2.1 Opening of the Day 2

Day 2 begins with a brief PowerPoint presentation outlining the agenda for the day, providing information about Workshop Session 2, and highlighting key insights from Day 1.

### 4.2.2 Empathize: Spray Drying Showcase at SEAMK/Future Frami Food Lab & Presentation of FoodLabs Concept

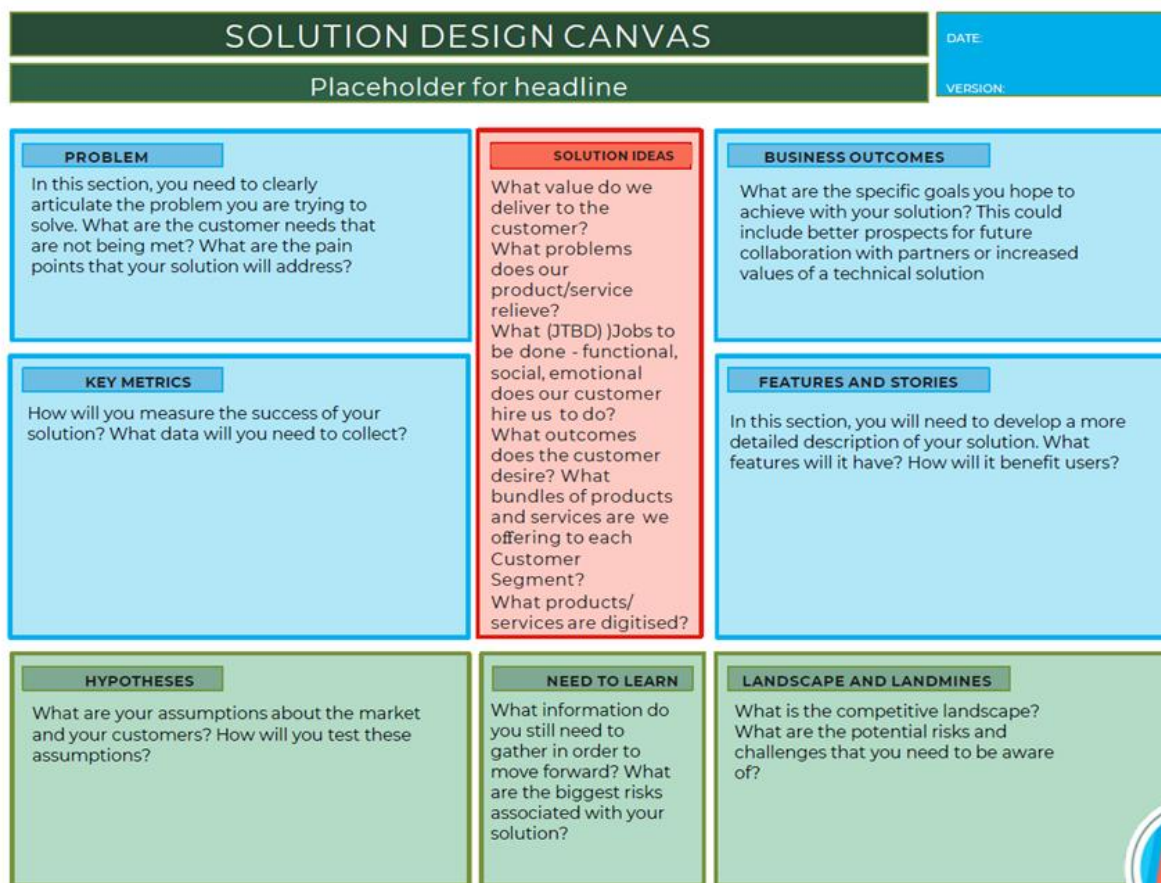
This event aimed to highlight the deep tech solutions Spray Drying and Membrane Filtration. Their advancements, underlying principles, and diverse applications were presented to illustrate their crucial role in shaping a sustainable future for food production. The agenda included an introduction to the ongoing "Future Frami Food Lab" project and the broader FoodLabs concept as a platform for experimentation and collaboration. Furthermore, participants were given a practical demonstration of membrane filtration, an introduction to the basics of spray drying, a live demonstration on the spray dryer, and the presentation of a finished spray-dried product.



**FIGURE 16: LAB VISIT DURING THE STUDY VIIT IN FINLAND.**

### 4.2.3 Prototype: Fill out Problem-Solving Canvases

Based on the identification of the most important challenges on Day 1, the workshop focused on developing solutions for the four defined key topics. The groups were free to approach their solutions individually; the Problem-Solution Canvas was only offered as a methodological tool to support and structure the brainstorming process, but its use was not mandatory.



Modified version of the "Solution Design Canvas." Original licensed under Creative Commons Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0). Available at: <https://miro.com/app/board/uXIVKY-c9eM/>



**FIGURE 17: SOLUTION CANVAS FOR THE WORKSHOPS ON DAY 2.**

### **Group: User stories and stakeholders (for precision fermentation and fermentation in general)**

The working group began by identifying user stories and key bottlenecks related to precision fermentation.

The group held an intensive discussion on marketing strategies, highlighting packaging and labelling as crucial aspects alongside the product itself. Participants debated whether a different nomenclature for the product, such as "cultivated meat," would help consumer acceptance. To increase acceptance, testing would be very important, but this is often not permitted for Novel Food or is tied to excessive bureaucracy. A central solution idea proposed was to launch educational programs starting at a young age and collaborate with chefs to develop new recipes. Participants identified several critical hurdles:

- **Financing and Regulation:** The need for high investments can be a problem, especially for smaller companies, while subsidies are not always supportive. The group saw an opportunity to study markets that introduced precision fermentation some time ago. Furthermore, the lack of scale-up capabilities due to strict regulations was identified as a bottleneck, where Living Labs could be a game changer.
- **Technical and Logistical Bottlenecks:** Scale-up itself is difficult. The availability and stability of the feedstock need to be guaranteed year-round. Additionally, the efficacy of technology improvement and energy efficiency need to increase.

The collected points condensed into the following main challenges:

- The food processing industry generally suffers from a poor image.
- Not enough effort is put into marketing and storytelling, and there is a great fear of negative public image.
- The topic of food is generally very sensitive and closely linked to culture.
- Language and definitions play an important role in public perception.

### **Developing Solution Ideas**

To improve the acceptance and knowledge level regarding novel food technologies, the group developed concrete proposals for education and awareness. These include creating lifelong learning opportunities through continuing education and self-education tools. The topic should be integrated into kindergarten and school programs at an early stage. Public outreach is to be achieved through workshops, seminars, and open demo days, with easy language, school visits, and free tastings considered key measures. Practical examples like Novel Food cooking calendars, testing boxes, and retail campaigns should illustrate the possibilities. Furthermore, a positive communication strategy is crucial, involving sharing success stories and strongly focusing the narrative on the positive aspects of the technology, particularly sustainability.

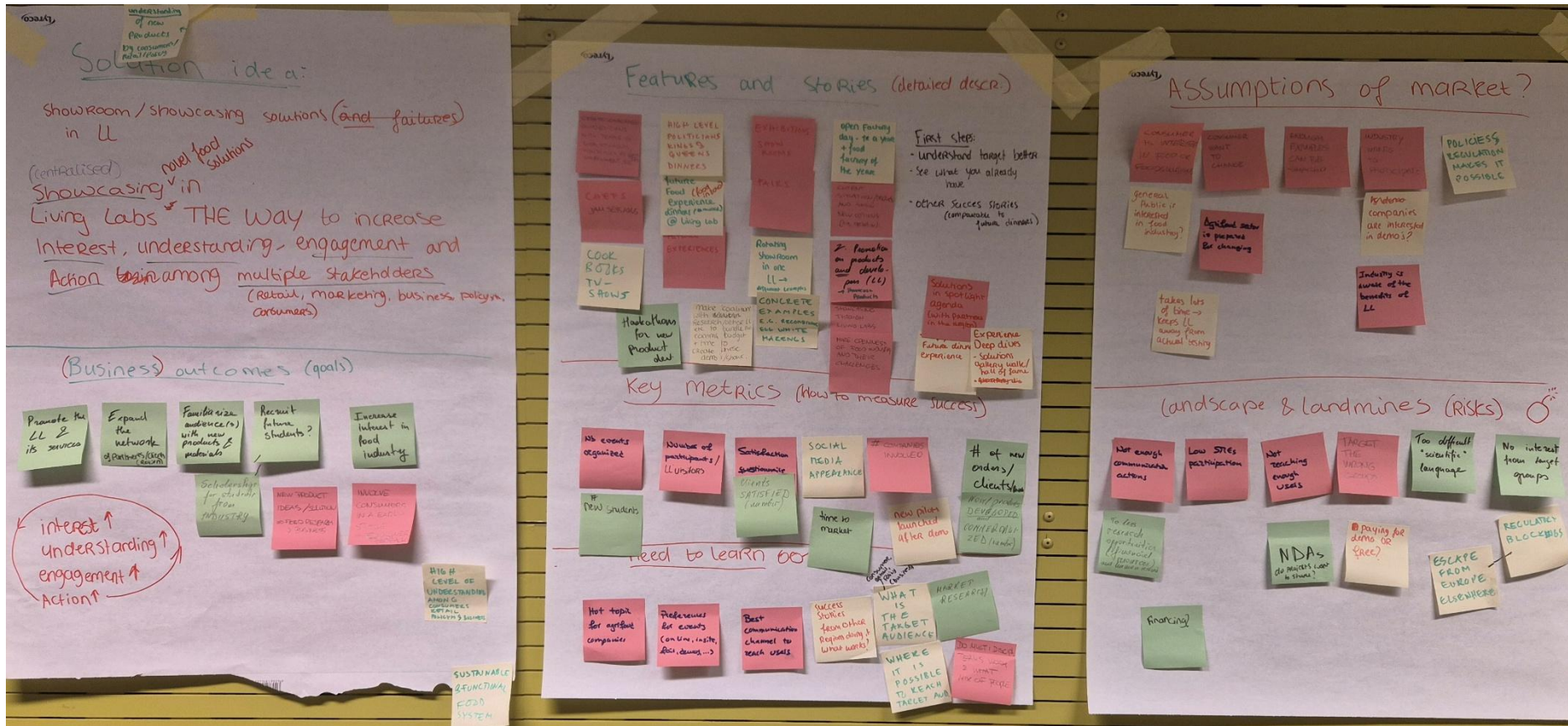


FIGURE 18: SOLUTIONS FOR “USER STORIES AND STAKEHOLDERS”.

## Group: EU Network of Living Labs to support innovation in precision fermentation

The group discussed in depth how a Network of Living Labs can boost innovation in precision fermentation by better coordinating the different phases of product development.

### Current vs. Ideal Development Cycle

Currently, the process begins with Research and Development (R&D) in labs, followed by applied development and scaling up in pilot facilities and companies. Actors like technology providers, consumers, retailers, regulators, and marketing teams only join in the pre-industrial phase. In the later industrial phase, consumers and marketing/sales dominate.

The group defined the ideal product development pathway as a more integrated approach: Research, companies (development and marketing), technology providers, engineers, and regulators should be included from the start to facilitate the entire process. Consumers and formulators would join during the applied development phase. Finally, during the scaling process, pilot facilities, technology providers, consumers, retailers, formulators, regulators, and marketing and sales would all be involved.

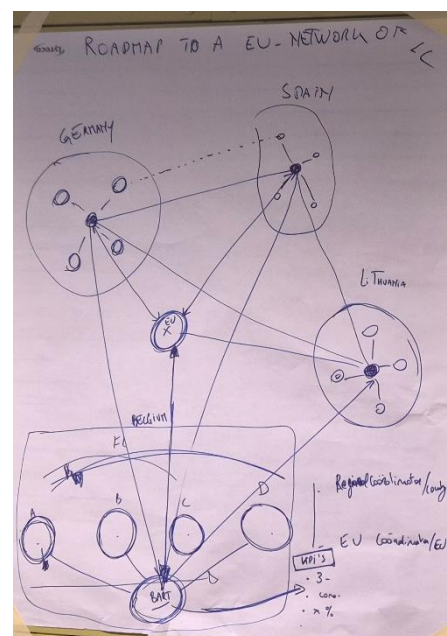
### Challenges and Solutions

A key difficulty lies in the different language used by policymakers and industry, which results in misunderstandings and knowledge gaps.

To enable the ideal, collaborative development pathway shown in this scheme, the group proposes:

- **Multidisciplinary Testing:** This should be facilitated by pilots, such as future experience dinners ("Dine like in 2024") and storytelling.
- **Learning from Best Practices:** Utilizing examples from other countries where the products are already established to address concerns (e.g., regarding food safety).

Living Labs can thus act as mediators and enablers to bridge the gap between basic research, market demands, and regulatory realities.



**FIGURE 19: SOLUTIONS FOR "EU NETWORK OF LIVING LABS".**

## **Group: Addressing key challenges in acceptance and regulatory issues (Regulatory Sandboxing)**

The working group identified the main problem as the lack of knowledge regarding the requirements for approval processes for new precision fermentation products. To address this, Living Labs or other supporting entities should focus on communicating what is possible rather than just highlighting restrictions.

### **Development of a Regulatory Tool**

The group decided to pursue the idea of developing a decision-making tree or a GPT-based tool covering basic requirements and food safety issues in Europe.

### **The Benefits of Such a Tool**

The tool would speed up research and development, make it easier to start, and increased transparency would lead to a clearer process and higher consumer acceptance. Centralized and secure expertise and knowledge could lower the cost of advice for individual Living Labs. Furthermore, the workflow could serve as a blueprint for similar regulatory challenges, and being an exploitable asset, it would generate sustainable revenue.

### **Challenges and Lessons to Learn**

Before implementation, learning needs and potential "landmines" were identified: It is necessary to clarify what information is truly relevant, how to best gather and organize data, and what the best way is to translate expertise into a simple tool. Regulatory "landmines" include staying up-to-date with Europe-wide regulatory changes and managing possible gaps in the decision-making tree, especially regarding discrepancies between guidelines and real-life challenges (How to find the right balance and level of detail?).

### **Key Metrics and Staged Approach**

A staged approach was chosen for key metrics, starting small and scaling up agilely depending on who uses it and how often. Success should be measurable quantitatively (before/after comparison) using parameters such as: number of proposal attempts, failure rate, and success rate of start-ups during the process—though the availability of this data was questioned.

### **Future Actions**

The tool is intended not only to streamline processes but also to increase the impact and narrative for precision fermentation in general, by addressing how consumers can improve the adoption of novel food. This can be achieved by Living Labs educating consumers, and authorities smoothing the process.



### **Group: Knowledge Transfer for precision fermentation for Living Labs (Copy-Pasting Knowledge)**

The working group, initially named "Copy-Pasting Knowledge," quickly realized this term did not capture the reality-as circumstances are always individual. Instead, they recognized the enormous potential of strategic knowledge sharing between Living Labs in the food processing industry to drive innovation across Europe.

The core of this synergy lies in building a common infrastructure for knowledge transfer. The group identified several ways to realize this exchange:

- **Personnel Exchange:** Establishing Lab Exchange Programmes for technicians to transfer practical knowledge directly.
- **Knowledge Databases:** Creating central databases to increase the findability and accessibility of information, facilitating the replication of similar cases and successful approaches.
- **Process Standardization:** Developing a comprehensive "Manual for Living Labs" to share best practices and fundamental operational and management knowledge.

### **The Living Lab Network Toolbox**

A Toolbox was conceptualized as a central instrument for bundling this information. It is intended not only to share general project data but, more importantly, to learn from experience and collect knowledge about trainings, failures, best practices, resolved problems, and open questions.

Furthermore, the Toolbox should provide detailed information on the capabilities of individual Living Labs to enable targeted collaborations. This includes:

- Specialized Analytics.
- Used Digitalization approaches/Methods.
- Available Equipment and Data sharing possibilities.

### **Management and Strategy as Core Knowledge**

Participants placed particular value on the exchange of management strategies. Collective experience should help overcome hurdles more efficiently. Concrete ideas for this included:

- **Starter Guidance:** Developing a guide that covers the functions, best practices, and a manual for starting a Living Lab.
- **Manager Exchange:** Creating a platform for the exchange among Living Lab managers.

- Regulatory Expertise: Sharing knowledge about regulatory barriers and successful strategies to overcome them.

Overall, this approach aims to transform isolated test beds into a networked ecosystem where collective learning and shared expertise can exponentially increase innovative power.

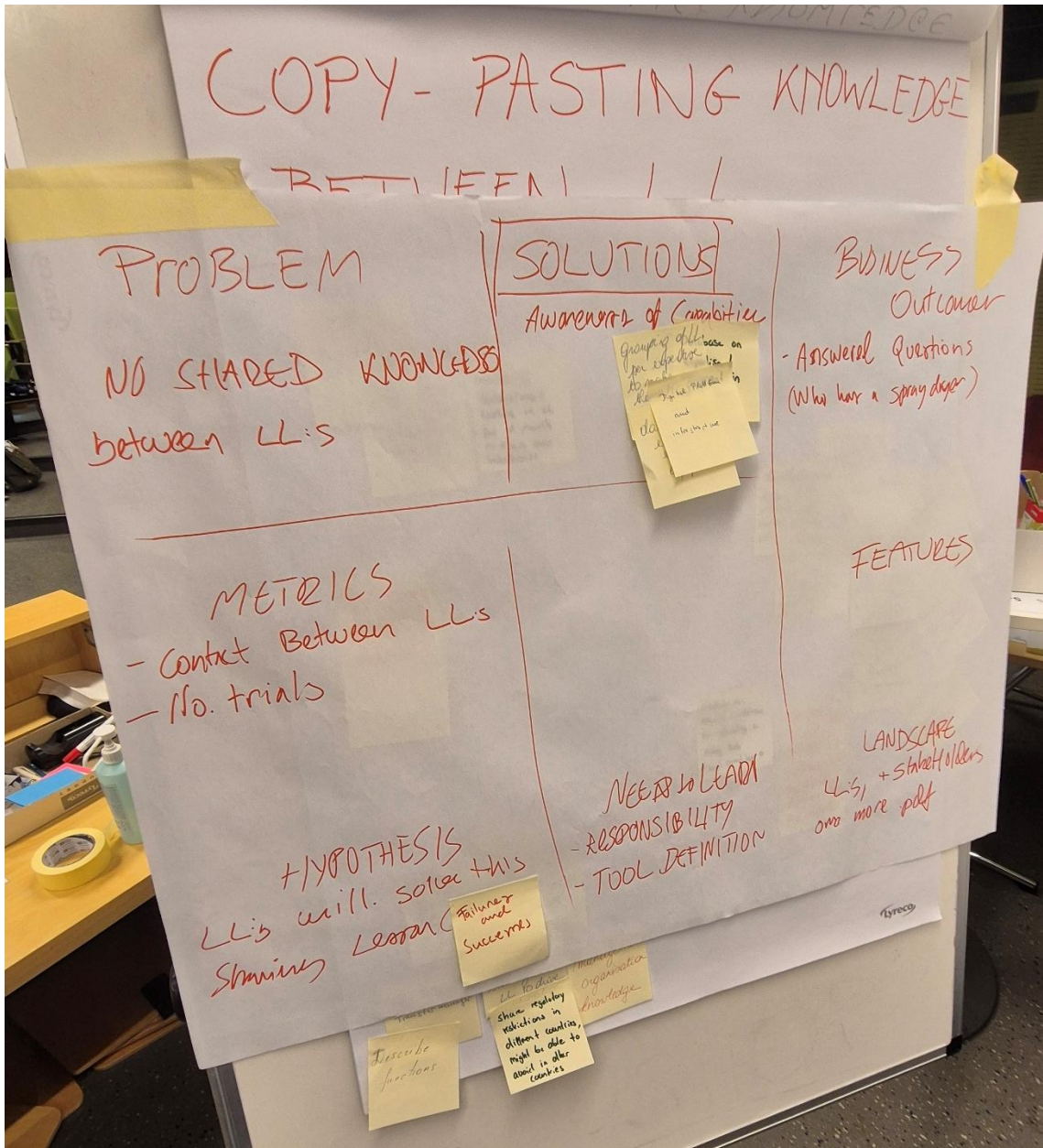


FIGURE 21: SOLUTIONS FOR “KNOWLEDGE TRANSFER”.

#### **4.2.4 Group reflection & Wrap-up of the Day 2**

After intensive group work at the thematic booths, the participants gathered in the auditorium, where each group or the group moderator presented the solutions and ideas they had developed.

##### **Commitment Circle: Transforming Ideas into Action**

The formal conclusion of the workshop was marked by the Commitment Circle. In this 15-minute segment, each group committed to one concrete action they would undertake as a direct follow-up to the workshop's outcomes.

To ensure the sustained development of the knowledge gained and to move beyond the ideas sketched on the canvases, mandatory follow-up actions were also agreed upon. This includes the organization of subsequent virtual meetings within the respective topic areas, aimed at deepening, concretizing, and transforming the solutions outlined in the canvases into operative work packages.

Following this, participants had the opportunity to provide final feedback on the workshop and sign up for the online feedback survey.

##### **Wrap-up and closing of the study visit in Finland**

The main event of Day 2 concluded with a 30-minute, facilitated Wrap-up Session. Here, participants reflected on the most important learning outcomes ("What did you learn today?"), summarized the Key Learnings of the entire workshop, and reaffirmed the relevance of the developed solutions. The moderators also provided an outlook on the next SIXFOLD events, which will serve as a platform for progress checks on the agreed commitments. All attending experts were warmly thanked for their valuable participation and for generously sharing their knowledge and experience. They were strongly encouraged to remain actively involved in the future phases of the project and, crucially, in the European Network of Agrifood Living Labs within the SS4AF Community.

The official workshop ended here, followed by a brief thank you and information regarding the planned evening activities

## 5. Report on study visit in Lithuania

This section describes the four-day study visit to Vilnius, Lithuania, which focused on the strategic intersection between networking and the financing of Living Labs. The aim was to investigate how ecosystem mapping and sustainable finance models can transform collaborations into investment-ready solutions for the agricultural and food sector.

**Day 1 & Day 2 - Innovation Sprints and Mentoring:** SIXFOLD experts contributed as mentors and subject matter experts to the ENACT Hackathon and Innovate-EU. They supported over 80 SMEs in ideation, deep-tech scaling, and "pitching clinics," ensuring that developed concepts were technologically sound and market-ready.

**Day 3 - AgriFood Forum and Problem Definition:** The network participated in the AgriFood Forum, where SIXFOLD members joined expert panels to shape the sector's strategic realignment. In the afternoon, a joint workshop session utilized "Empathize" and "Define" steps to identify SME hurdles and specific requirements for potential funders. The day concluded with a festive gala dinner, which provided further opportunity for informal networking.

**Day 4 - Practical Insights and Solution Development:** Following visits to the Center for Physical Sciences and Technology (FTMC) and Vilniaus kolegija (VIKO), participants split into two specialized groups to develop concrete frameworks:

- Group 1: Bridging the Gap: A Strategic Framework for SME Investment in Living Labs.
- Group 2: Investment Models for Scalable Collaboration.

The visit concluded with a "Commitment Circle," where six modular prototypes were identified. The plenary prioritized four key tools for the "Investment Readiness Kit": targeted roadmaps, one-stop-shop platforms, an international LL management playbook, and strategic storytelling with investor-oriented metrics. These tools were selected to bridge the "Valley of Death" by providing the strategic infrastructure and economic transparency required to secure long-term investment.

## 5.1 Visit to the Living Labs and Events in Lithuania

### 5.1.1 Visit to the Living Lab Center for Physical Sciences

The Center for Physical Sciences and Technology (FTMC) in Vilnius is Lithuania's largest state-run research institution and a leading center of excellence in the Baltic region. SIXFOLD participants were given a tour of the laboratories, where more than 500 scientists work at the interface between fundamental research and industrial applications. During the tour and the subsequent technical presentation, the center's core competencies, which are particularly relevant for digital transformation, became clear. The FTMC is known for its expertise in laser micromachining and fiber laser technology, which is directly applied in precision manufacturing and sensor technology. Participants also gained insights into the cleanrooms, where research is conducted on novel nanotechnologies and functional materials to, for example, extend the lifespan of industrial components. Another key focus was the development of advanced sensors for non-contact environmental monitoring – technologies that are essential for data acquisition in living labs and digital twins.

The FTMC is known for its expertise in laser micromachining and fiber laser technology, which is directly applicable in precision manufacturing and sensor technology. With over 300 active industry contracts per year, the FTMC specifically supports SMEs in overcoming technological barriers. As a so-called "doing infrastructure," the center offers companies direct access to prototyping, 3D printing processes, and accredited testing laboratories to guide innovations from initial idea to market readiness. The visit impressively underscored the need to more closely link cutting-edge physical technologies with digital business models and offered numerous starting points for future international collaborations in the field of applied research.



**FIGURE 22: SIXFOLD MEMBER AND EXPERTS AT THE LIVING LAB " CENTER FOR PHYSICAL SCIENCES"**

### 5.1.2 Visit Vilnius kolegija (VIKO)

The Vilnius kolegija (VIKO) / University of Applied Sciences is one of Lithuania's leading practice-oriented higher education institutions and serves as a central innovation hub at the interface of academic education and industrial application. The visit focused particularly on the Faculty of Agrotechnology and its specialized expertise in food technology.

The SIXFOLD participants received a comprehensive presentation on the university's applied research, which is geared towards the needs of the regional economy. The focus was on innovative approaches to optimizing production processes and developing sustainable food products. During the subsequent tour of the laboratories, the participants were able to see state-of-the-art testing environments for analyzing food quality, product safety, and chemical composition.

These laboratories serve as practical incubators where students and researchers collaborate with companies on prototypes. The visit highlighted VIKO's role as a partner in innovation ecosystems: it provides the necessary infrastructure for testing new technologies in the food sector, thereby making a direct contribution to the digital and sustainable transformation of the entire industry.



**FIGURE 23: GUIDED TOUR OF THE UNIVERSITY'S LABORATORIES AND TECHNICAL FACILITIES**

### 5.1.3 ENACT Hackathon (Social economy) and Innovate-EU (Deep Tech Agrifood)

On November 24 and 25, 2025, experts from the SIXFOLD network contributed to the European innovation landscape through two parallel events: the ENACT Hackathon, which focused on the social economy, and Innovate-EU, a deep-tech initiative in the agri-food sector. The events were conducted as intensive, one-day innovation sprints and took place concurrently with the AgriFood Forum.

The primary goal of this collaboration was to co-create digital solutions specifically addressing the priorities identified in the current innovation gap analysis and needs assessment for the agri-food ecosystem. In a multidisciplinary environment, participants, including over 80 SMEs from the social economy and various ecosystem partners, worked on developing, prototyping, and presenting new approaches.

SIXFOLD members played a key role as mentors and subject matter experts. They guided the teams through the critical phases of ideation and technical implementation to ensure that the developed concepts were both technologically sound and practical. Beyond mentoring, they contributed to knowledge exchange through presentations and keynote speeches, showcasing case studies on deep-tech scaling and presenting relevant digital tools.



**FIGURE 24: GROUP PRESENTATION AT THE ENACT EVENT**

The event culminated in an evaluation of the results by a panel of experts, including SIXFOLD members. By leading pitching clinics, they also helped the teams to present their business models and technological solutions effectively. Participation in these events underscores SIXFOLD's expertise at the intersection of technical competence and strategic process support, and reinforces the network's position as a key player in addressing digital challenges in the agricultural and social sectors.

### **5.1.4 AgriFood Forum**

In addition to the intensive innovation sprints, the SIXFOLD network was significantly involved in the technical program of the AgriFood Forum. As one of the most important international platforms in the Baltic region, the forum brings together over 300 experts from more than 20 EU member states annually to shape the future of sustainable agriculture. In its role as a central interface between politics, business, and science, it facilitates direct exchange between EU and OECD decision-makers, clusters, and innovators. Together, they discuss strategies for a resilient, digital, and ecologically sustainable food system in Europe. The event served as a strategic platform to advance the digital transformation of European agricultural systems at various political and operational levels. SIXFOLD members contributed their expertise to two expert panels, actively shaping the strategic and operational realignment of the sector.

#### Panel 1: Multi-Level Innovation as a Policy Framework

One panel of the forum focused on the application of the OECD Oslo Manual to the European agricultural transformation. SIXFOLD participants discussed at the political level how global guidelines (OECD, EU) can be integrated with regional implementations.

- Key points: The discussion highlighted how "new-to-firm" innovations can be scaled to global "new-to-world" solutions through coherent support frameworks.
- Cluster role: A focus was placed on clusters as "system orchestrators," acting as essential intermediaries between political ambition and entrepreneurial innovation.
- Harmonization: The goal is closer cooperation between the OECD and the EU to create uniform governance models and metrics for the resilience of food systems.



**FIGURE 25: PANEL DISCUSSION ON THE TOPIC: MULTI-LEVEL INNOVATION AS A POLICY FRAMEWORK**

### Panel 2: Regions and Living Labs as Accelerators

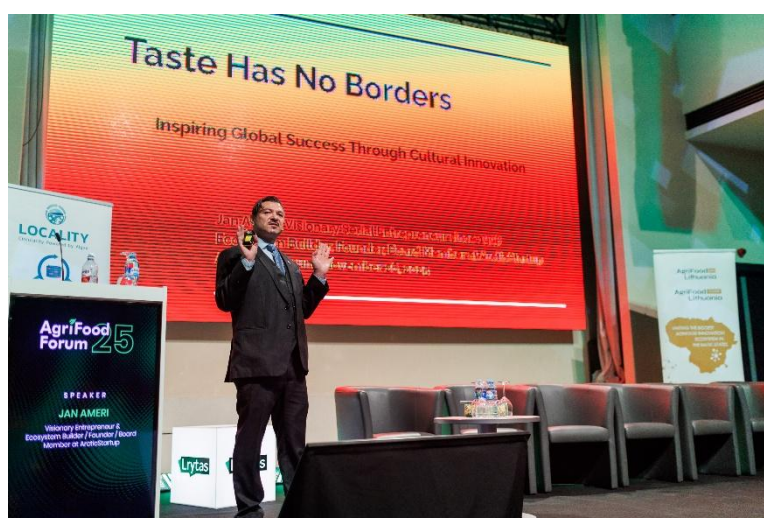
In a further discussion round, SIXFOLD members explored the operational role of regional ecosystems in greater depth. This session demonstrated how living labs act as a bridge between innovation policy and concrete action at the company level.

- **Living Labs as Infrastructure:** Participants emphasized that Living Labs form the crucial "doing infrastructure", enabling co-creation, testing, and de-risking of new technologies directly in practice.
- **Interregional Learning:** Shared methodologies and collaborations can scale the impact of local pilot projects to the European level.
- **SME Support:** Discussions also focused on how intermediaries can support SMEs in bridging the gap between innovative approaches and the necessary financing instruments.



**FIGURE 26: PANEL DISCUSSION ON THE TOPIC: REGIONS AND LIVING LABS AS ACCELERATORS**

In addition to the panel discussions, SIXFOLD expert Jan Ameri, visionary and co-founder of ArcticStartup, gave a keynote presentation entitled “Taste Has No Borders”, in which he impressively demonstrated how cultural innovation can act as a driver for global success in the agricultural and food sector.



**FIGURE 27: KEYNOTE ON THE TOPIC: TASTE HAS NO BORDERS**

The event concluded with a gala dinner. This setting provided participants with an opportunity to delve deeper into the topics of the AgriFood Forum through in-depth discussions. The intensive networking facilitated the development of new partnerships aimed at increasing the visibility of regional ecosystems in future European agricultural policy.



**FIGURE 28: SIXFOLD MEMBERS AND EXPERTS AT THE AGRIFOOD 2025 GALA DINNER**

## 5.2 Workshop Session Day 1 of the study visit in Lithuania

The first workshop day of the Vilnius Study Visit focused on the core challenge of how Living Labs (LL) can attract investment for the scalable market adoption of AgriFood innovations. Initially planned as two separate tracks, the expert group decided to merge into one large discussion to address the central question: “How can we attract investment – both B2B and B2C – for scalable adoption?”

This collaborative approach revealed a significant realization: regardless of the country of origin, all participants face the same structural issues. This shared reality served as the foundation for defining the collective barriers in the European Agrifood ecosystem.

### 5.2.1. Status Quo and Empathic Analysis: The Stakeholder Perspective

The group analysed why the bridge between technical development in the lab and market-ready investment often fails. Three primary "pain points" were identified:

- **Knowledge and Skills Gaps:** There is a notable discrepancy between scientific excellence and entrepreneurial action. Many scale-ups possess high technical expertise but lack specific food-sector knowledge and the strategic "know-how" to grow a business. Scientists often struggle to think as entrepreneurs, frequently testing innovations in closed "friends & family" circles rather than involving external experts and market realities early on. We are providing education, but often not to the right people or with the wrong focus.
- **The Complexity of SMEs:** Many companies, particularly smaller SMEs, are unaware of their own technological problems or lack the internal background to implement prototyping results from a Living Lab. There is a significant gap in translating how new technologies can solve specific company needs.
- **Living Lab Business Models:** Most LLs lack sustainable business models. Many are grant-funded or project-based, leading them to try to offer "a little bit of everything" rather than positioning themselves as specialized facilitators for investment readiness.

### 5.2.2 Defining the Problem: The "Investment Gap"

The group identified that the most critical gap is not near-market funding, but early-stage development. While funding is accessible for solutions close to market entry, there is a massive market gap for earlier stages.

- **Public-Private Funding & Risk:** Agrifood investments involve high risks and long amortization periods. A mix of public and private funding is essential to de-risk these early stages.
- **The Role of Business Angels:** While formal investment clusters exist, there is a lack of personal networking. Business Angels were identified as a vital but underutilized resource; they are often more approachable for smaller enterprises and willing to support the industry at an earlier stage than venture capitalists.
- **The "Ownership" Barrier:** When universities are paid via public grants, companies often feel they do not "own" the result. This ambiguity regarding Intellectual Property (IP) discourages private investment.

### **5.2.3 Conclusion for day 1: Key Takeaways and Strategic Directions**

To move from discussion to delivery on Day 2, the following strategic takeaways were defined:

- **Start with Company Needs:** Every LL activity must add measurable value to the company. Innovation must not simply make the end product more expensive; it must solve a functional or economic problem.
- **Targeted Roadmaps:** The idea of a "Roadmap" was prioritized. This should be a targeted guide depending on the size and maturity of the enterprise to bridge the knowledge gap between technology and adoption.
- **International Playbook:** We need to move beyond the LL as an isolated entity. An international playbook should define how to run the best LLs and how to take innovations "beyond the lab" as a seamless piece of the overall scaling process.
- **Policy and Government Engagement:** There is a clear need to involve politicians. Governments must better understand *why* they want a Living Lab and the functional differences between regional and European levels. A clear message or advice must be formulated for the European Commission to ensure policy-investment alignment.

**Conclusion:** By focusing on closing the education and investment gaps in early-stage development, the group has established a solid baseline. The next step is to transform these findings into concrete process models and roadmaps that make Living Labs a valuable tool for connecting close-knit investors with innovative SMEs.

## 5.3 Workshop Session Day 2 of the study visit in Lithuania

Following the recap of the initial findings from the first day, the second session of the workshop transitioned into a more focused, practical phase. To ensure a diversity of perspectives while maintaining a common goal, the participants were divided into two working groups.

In this session, the two groups worked in parallel with the same challenge, following the work done the day before. Building directly on the "Empathize" and "Define" phases from Day 1, both groups were tasked with developing concrete solutions for the core problem: attracting B2B and B2C investment for scalable adoption. To structure this process, both teams utilized a Solution Design Canvas. This tool allowed the participants to systematically map out value propositions, identify key stakeholders, and define the necessary infrastructure to bridge the gap between early-stage innovation and investment readiness. By working on the same challenge simultaneously through this structured framework, the teams were able to explore different strategic angles while ensuring that the resulting ideas remained grounded in the previously identified problem definition.

### 5.3.1 Group 1: Bridging the Gap: A Strategic Framework for SME Investment in Living Labs

The current analysis reveals a significant gap between the scientific world of Living Labs (LL) and practical application in the business sector. Specifically in regions like Lithuania, there is an urgent need for support from the business world to actively involve companies in projects. One of the main barriers is the hesitation of companies to approach scientific institutions; persuasive work is required to demonstrate that these services are practical and usable.

Companies often do not know which specific problems they can bring to a university or an LL. In this context, it was discussed that commercially oriented LLs might act more effectively in some cases. Furthermore, ongoing production acts as an obstacle, as companies cannot simply stop their operations to test new innovations.

#### 5.3.1.1 The Vision: "1 Door Opening + 1 Shop Stop"

To overcome these hurdles, a central platform was developed to serve as an integrated point of entry for SMEs. This platform offers a guided roadmap for every step of innovation implementation.

- **Interactive Navigation:** A tool with filter functions should enable companies to select LL offers based on specific topics at a European level.
- **Holistic Guidance:** The platform provides guidance and links to resources such as mentors, investors, and Intellectual Property (IP) experts.
- **Resource Sharing:** A "Shop Stop" concept allows access to equipment that can be rented or purchased, as well as consumer insights and specialized knowledge.

### 5.3.1.2 Investment Strategies and Networking

A central lever for scaling is attractiveness to investors. This increases significantly when investment is directed toward a functioning overall network rather than isolated facilities.

- **Investment Goods:** Capital should primarily flow into machinery, sensors, robotics, and knowledge exchange.
- **Financing Models:** Various funders must be brought together, including sector-based investors, business angels, and founder syndicates.
- **Visibility:** Networking is only effective if the actors remain visible; LLs should serve as a "showcase" for new products and machinery.
- **Regional Anchoring:** The concept of a regional "mushroom" was established—a central hub that investors can directly turn to for guidance.

### 5.3.1.2 Hypotheses for the Future

The success of this model depends on a fundamental shift in mindset: the implementation of technology must be understood as an innovation in itself.

- **LL as an Enabler:** Living Labs act as independent parties helping SMEs understand their business requirements and consumer needs.
- **Internationalization:** Beyond certain maturity levels (TRL), the search for international partners and cross-border cooperation becomes essential.
- **Technology Transfer:** Bringing together product knowledge and new machinery knowledge is key to implementing "non-fancy technologies" that pay for themselves within a year.

### 5.3.1.1 Next Steps and Learning Needs

To increase acceptance, it is vital to communicate more clearly what the Return on Investment (ROI) of LL services looks like for both SMEs and investors. Additionally, LLs must communicate better with one another and be fully integrated into the common platform—one idea for this is the use of a specialized Living Lab Chatbot.



### 5.3.2 Group 2: Investment Models for Scalable Collaboration

The analysis of Group 2 highlights a highly fragmented innovation landscape. A primary issue is the absence of a genuine "market for innovations" where companies can find targeted solutions. Furthermore, there is a significant gap in knowledge transfer: researchers often struggle with how to commercialize their findings, while medium-sized enterprises lack the necessary resources to achieve significant growth.

The ecosystem also suffers from structural differences between industry-led and university-based Living Labs (LL). While industry labs often operate with more agility, university-based facilities tend to be smaller and face more difficult access to financing.

- **Barriers for Stakeholders:** Researchers often lack the resources and expertise to utilize LL structures effectively.
- **Skill Shortage:** A deficit of qualified personnel in food technology and a lack of an "innovation mindset" hinder the productive use of available data.
- **Communication Barriers:** There is a lack of a common "technical language" between partners. SMEs are often unaware of their core problems when seeking external assistance.

#### 5.3.2.1 Strategic Vision: Sustainable Business Models and Synergies

To elevate Living Labs beyond the status quo, new and viable business models must be developed. The group proposes a massive focus on connecting people—Living Labs act as "enablers" that help SMEs validate marketable business concepts.

- **Models for Independence:** Development of "self-sustainable models" to reduce dependence on individual project-based funding.
- **Urban Investment:** Cities could act as active funding sources by issuing targeted calls for specific local needs (based on the *Innokaupungit* model in Finland).
- **Regional Bridgeheads:** Integration of clusters like *Brainport* Eindhoven, which serve as a link, connecting actors and creating a strong, shared identity.
- **Focus on Industrialization:** A central lever is the transfer of innovations from laboratory or kitchen scale directly into industrial production ("scale-up food production").

#### 5.3.2.2 Financing Paths and Investor Engagement

From an investor's perspective, the current system appears too fragmented, and many financing instruments do not function optimally. To bridge the "Valley of Death," various sources—ranging from business angels and sector investors to specific EU funds for scale-up hubs—must be strategically bundled.

- **Holistic Investments:** Capital should not flow into isolated locations but into the combined strength of the entire network.
- **Rethinking Success Metrics:** LLs must prove their economic relevance. Success is measured by whether SMEs reach market maturity, secure jobs, and generate follow-up financing.
- **Transparency through Commitment:** Joint Memorandums of Understanding (MoUs) between institutions should send a clear message to the EU Commission and guarantee investors reliable standards regarding food safety, returns, and sustainability.

### 5.3.2.3 Future Hypotheses and Market Penetration

A decisive factor for success is the continuous validation of a product's market fit directly with the consumer.

- **Cross-border Cooperation:** As the maturity level (TRL) increases, the search for international partners and sustainable sourcing strategies becomes a critical factor.
- **Perception of Innovation:** Technical implementation must be recognized as an independent and valuable innovation process in its own right.

### 5.3.2.4 Next Steps and Learning Needs

The group's most critical realization is that financial investments remain secondary as long as human and communicative networking is not fundamentally functioning. A key next step is therefore to establish the necessary level of communication through the SIXFOLD project and to deepen collaboration with commercial partners. To increase the acceptance of the ecosystem, there is a clear learning need to develop impactful storytelling: strong, tangible success stories must be prepared to convince investors in the long term. In this regard, the focus should be increasingly on analysing successful international models—such as those from the US. Ultimately, the goal is to foster a living culture of openness and significantly increase the visibility of the entire Living Lab network to sustainably secure the transition from research to market readiness.



## 5.4 Group presentation and Conclusions

After the workshop sessions, both groups came together to present their results and discuss strategic synergies. This exchange and the subsequent plenary discussion resulted in an ecosystem of modular solutions aimed at translating the abstract vision of Living Lab investments into tangible, secure, and economically attractive tools for SMEs and investors in the AgriFood sector. The following six prototypes were identified:

### **Developing targeted roadmaps for the investment process**

- A strategic step-by-step guide designed to navigate SMEs and startups from TRL 5 to TRL 9.
- It serves as a decision-making aid by breaking down the complexity of the innovation journey into manageable phases, ensuring that capital is guided precisely to where it is needed most.

### **Creation central network platforms (One-Stop Shops)**

- An integrated "1 Door Opening + 1 Shop Stop" platform that connects SMEs with the full spectrum of Living Lab services—from equipment rental and consumer insights to expert mentoring.
- By incorporating a quality check for participants, the platform creates a trustworthy marketplace for innovation.

### **International Playbook for Living Lab Excellence**

- A standardized manual and operational framework—including the proposal of a Memorandum of Understanding (MoU)—to harmonize Living Lab operations across different regions.
- It acts as a bridge between labs, universities, and industry to establish a common "technical language."

### **Strategic Storytelling and Investor-Oriented Success Metrics**

- A framework that translates the impact of Living Lab support into economic figures through clear KPIs and compelling narratives.
- It addresses the specific expectations of investors regarding ROI, job creation, and long-term sustainability.

### **Regional "Mushroom" Hub Model (Central Point of Contact)**

- A physical or institutional hub in the region (the "Mushroom") that serves as a visible showcase for new products and machinery.
- This model acts as an anchor point for local investors and ensures that the regional competencies of the labs remain visible and accessible to the business community.

### **AI-Powered Living Lab Chatbot**

- A digital assistant that automates communication within the network and manages the interconnection between individual labs.
- It solves the problem of continuous exchange by helping SMEs quickly find the right contact persons and translating complex requirements into understandable recommendations for action.

During the final plenary session, it was decided that these six prototypes form a comprehensive "Investment Readiness Kit." While the Roadmaps and the Maturity Check meet the SMEs where they are, the One-Stop Shop Platform and the Mushroom Model provide the necessary infrastructure for market access. The International Playbook and the Chatbot ensure that the network can be scaled professionally, while Strategic Storytelling provides the economic justification for investors. The justification for this selection lies in the holistic approach required to bridge the "Valley of Death": Together, these tools minimize entry barriers and sustainably smooth the acceptance curve for complex investments in the European agricultural sector. The Living Lab network is thus transformed from a fragmented research landscape into a visible, experiential, and therefore investable ecosystem.

## 6. Report on study visit in Spain

This section describes the two-day study visit in A Coruña, Spain. The focus was on the practical implementation of Digital Twins as well as the inherently linked topics of data access, data quality, and cybersecurity within the AgriFood sector. The objective was to position Living Labs as trustworthy mediators that support SMEs in navigating these complex challenges.

**Day 1** began with an introduction to the regional Agrifood ecosystem in Galicia, followed by technological presentations on Digital Twin technologies. An Inspiration Talk on Living Labs prepared participants for the methodological work ahead. Before the workshops, participants visited the host's Living Labs at ITG: the CSA (Cybersecurity & Data) and the Galaxy Lab (Drones & Sensors). These visits provided a practical foundation for understanding the technical requirements of data quality and secure transmission systems. In the subsequent workshop session ("Empathize" and "Define"), participants were divided into two working groups to identify barriers to digital transformation, focusing on two key areas:

- Topic 1: Skills gap hindering Digital Twin – This group analysed hurdles such as the lack of expertise and the technological complexity of digital models.
- Topic 2: Data access, quality, and cybersecurity – This group identified critical factors such as difficult data access, concerns regarding cybersecurity, and the lack of standards for data quality.

**Day 2** started with a welcome and a recap of the findings from the previous day to prioritize the most important approaches. Afterward, participants moved into the "Ideate" and "Test" phases to work on concrete solutions:

- Ideate and Test: The groups developed approaches to bridge the technological gap. A key focus was refining the role of the Living Lab as a "Neutral Intermediary," which guarantees secure data access ("Secure-by-Design") and ensures data quality through standardized pipelines.
- Define Concrete Actions: Specific roadmaps were created to integrate these solutions into the Living Labs' service portfolios—ranging from legal clarification of data ownership to technical audits to prevent sensor drift.

Following the group work, all participants gathered for a collective reflection and the "Commitment Circle." During this session, six modular prototypes were identified. The plenary decided to prioritize the further development of the first three prototypes: the AAS Showcase, the Agrifood Maturity Check, and the Value-to-Digital Twin ROI Calculator. This selection was based on the fact that they address the most urgent hurdles: the Maturity Check assesses existing resources and data quality, the ROI Calculator proves the economic benefit, and the AAS Showcase makes secure data visualization and the utility of the Digital Twin visually experiential and thus trustworthy for the first time.

## 6.1 Visit to ITGs Living Labs: CSA and Galaxy Lab

The ITG (Instituto Tecnológico de Galicia) is a technology center in Spain that acts as a driving force for digital transformation and applied research. During a visit to Cidade das TIC (City of ICT) in A Coruña, a newly developing technology park and innovation hub, participants gained in-depth insights into the work of the specialized Living Labs: the CSA (Centre for Advanced Systems and Unmanned Systems) and the Galaxy Lab.

The presentations and lab tours highlighted the ITG's pioneering role in three key future-oriented fields:

- **Intelligent Energy Systems:** The ITG demonstrated innovative solutions for managing energy grids and integrating renewable energies. A key focus was the use of artificial intelligence to optimize energy consumption in buildings and industrial plants. By developing intelligent algorithms, peak loads are predicted and efficiency is increased, making a direct contribution to decarbonization.
- **Unmanned Systems (Drone Technology):** At the Galaxy Lab, a unique test infrastructure for unmanned aerial vehicles (UAVs) in Europe, participants experienced the next generation of drone technology. The ITG conducts research here on autonomous flight systems for complex operational scenarios – from the inspection of critical infrastructure to logistics applications in urban areas. The demonstration of the safe integration of drones into controlled airspace (U-Space) and the use of sensors for real-time data acquisition was particularly impressive.
- **Robotics and Autonomous Systems:** Another focus was on robotics and its application in industrial environments. The ITG develops autonomous mobile robots capable of performing complex tasks in dynamic environments. These systems are closely linked to the AI models developed in the Galaxy Lab to enable seamless human-machine interaction and make automation economically viable for SMEs.

The visit to the Cidade das TIC underscored the importance of this "doing infrastructure": The ITG offers companies not only theoretical knowledge, but also a real-world testing environment for de-risking and prototyping cutting-edge technologies. Acting as a bridge between research and the market, the ITG supports SMEs in efficiently implementing complex digital solutions in the areas of energy efficiency and autonomous mobility, enabling them to remain internationally competitive.

## 6.2 Presentations at the study visit in Spain

### 6.2.1 Agrifood ecosystem in Galicia

In a presentation on the topic "The Agrifood Ecosystem in Galicia," from Helena Jamardo Estévez, R&D Project Manager at Clusaga, outlined the strategic direction and profile of the Galician food sector, highlighting the tension between its traditional strengths and the modern demands of a global market.

The Galician ecosystem rests on four fundamental pillars that ensure its competitiveness: high export capacity through efficient supply chains, an uncompromising commitment to product quality—supported by numerous protected designations of origin—extensive biodiversity, and deeply rooted traditional knowledge. This know-how, passed down through generations, forms the authentic foundation upon which modern innovations are built.

Despite this strong foundation, the region faces significant structural challenges. Demographic change and an aging population make it difficult to secure skilled workers, while climate change necessitates rapid adaptations to production methods. Furthermore, intense global market competition and increasing regulatory complexity are putting pressure on businesses. To meet these challenges, digital transformation and the transition to comprehensive sustainability are essential, but this requires significant investment and new knowledge.

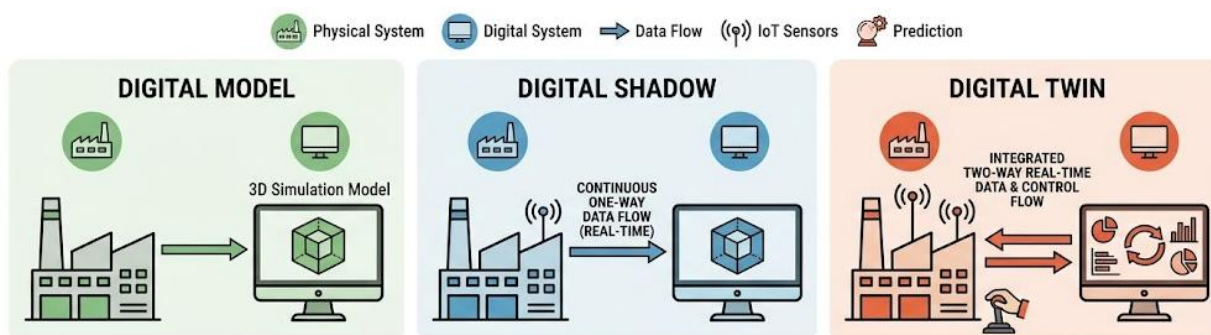
As a central orchestrator, the Galician Food Cluster (Clusaga) supports its members in six strategic core areas: innovation, markets and internationalization, talent management, sustainability, and business development, including administration and accounting. A significant portion of this work is dedicated to international networking. Through participation in European consortia and the exchange of best practices, Clusaga sustainably strengthens regional innovation.

In this context, the BFood – business factory program also plays a crucial role. As a specialized accelerator for food startups, BFood faces the task of not only promoting young companies technologically but also preparing them for the harsh realities of the market. Among the biggest challenges are scaling prototypes to industrial quantities, the difficult access to venture capital in a traditionally dominated sector, and complying with strict food safety standards even in the early stages of startup.

## 6.2.2 Digital twin technology

An additional expert presentation on the topic of "Digital Twin Technology" was conducted by representatives of the ITG Technology Center. The introduction to the subject as well as the fundamental technological concepts were presented by Gonzalo Blázquez Gil. Another key focus was the presentation of the INDAGA project and further application examples, which was carried out by Tamara Fanjul.

At the beginning, Gonzalo Blázquez Gil presented the activities and competencies of the ITG Technology Center. It became clear that the center operates interdisciplinarity in fields such as Artificial Intelligence, Internet of Things (IoT), data infrastructures, as well as sustainable and industrial systems. These competencies form the basis for the development of data-driven applications like Digital Twins. Subsequently, the basic concept of digital representations of physical systems was explained. A distinction was made between three levels: the Digital Model, the Digital Shadow, and the Digital Twin, which differ significantly in terms of their functionality and depth of integration. A Digital Model represents the simplest form. It is a static, digital replica of a real system, such as a simulation model or a CAD representation. This model has no connection to real-time data from the physical world. The Digital Shadow represents a further development in which a one-way data connection exists from the physical system to the digital model, allowing it to reflect the current state but without providing feedback. The Digital Twin, on the other hand, is characterized by a bidirectional connection. In addition to the continuous integration of real-time data, the digital system is capable of actively intervening in the real system. This ability for interaction and decision support constitutes the central distinction.



**FIGURE 31: DIFFERENCES BETWEEN DIGITAL MODEL, DIGITAL SHADOW AND DIGITAL TWIN**

In the further course of the presentation, the technical architecture of a Digital Twin was described. This includes data acquisition via IoT sensors, the integration of data into Data Spaces, analysis through Artificial Intelligence, and the implementation of decisions via control and automation systems. Particular emphasis was placed on the importance of interoperability and secure data exchange. A significant application focus was in the areas of Agrifood and the circular economy.

Concrete examples demonstrated how digital twins can be used to optimize agricultural processes, such as in precision farming or irrigation control. Furthermore, projects like RE-WITCH were introduced, which utilize digital twins to more efficiently use waste heat in industrial processes (e.g., in breweries or dairies).

Finally, Tamara Fanjul presented the INDAGA project, an industrial data space for the Galicia region. The goal of this project is to consolidate and make data from various industrial sectors usable, for instance, for applications in the field of carbon foot printing or process optimization.

In summary, the presentation showed that digital twins are to be understood as integrative systems that connect various technologies. Especially through bidirectional communication and the capacity for active control, they offer significant potential for the transformation of complex systems in industry and agriculture.

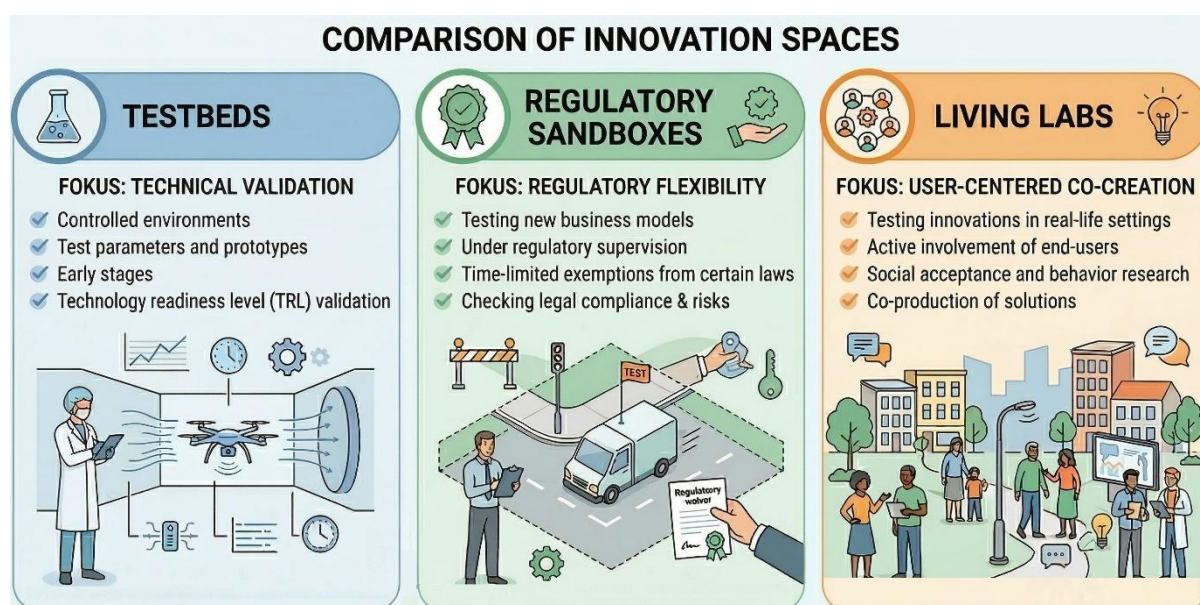
### **6.2.3 Inspiration Talk: Living Labs**

In the third expert presentation of the series, Juan Pablo Villar from SILO (Science & Innovation Link) spoke about the concept of "Living Labs" and their strategic importance in overcoming barriers between research, market acceptance, and regulation within the European Union. To begin, the structural hurdles for European innovation were addressed, noting that despite excellent research results, Europe often faces difficulties in commercialization and scaling. The primary causes identified were regulatory fragmentation, administrative burdens, and a lack of testing environments under real-world conditions.

To accelerate this process, various forms of experimentation spaces were presented, each setting different priorities:

- **Testbeds:** The focus here is primarily on the technical validation of prototypes in an early development phase. Specific technical parameters and functionality are tested under isolated conditions in a controlled, often lab-like environment. Since these tests usually have no impact on the public or the general market, there is little need for regulation, and compliance with existing technical standards is the main priority. Active involvement of end users is typically not planned at this stage.
- **Regulatory Sandboxes:** These serve to test innovations and new business models that might conflict with the existing legal framework. They offer a time-limited and geographically restricted exemption from current regulations to examine legal feasibility and potential risks under official supervision. The emphasis is therefore on regulatory flexibility. The goal is to collect reliable data to enable well-founded decisions on the adaptation of laws or regulations later on. User involvement is moderate here and serves more to observe impacts within the legally exempt framework.

- Living Labs: Living Labs represent a user-centered, open innovation ecosystem where the focus is on co-creation. Solutions are not developed in a lab but directly in a real-life environment (e.g., in a neighborhood or community) together with end users, where they are tested and validated. This is less about pure technology and more about social acceptance, user experience, and behavioral research. Accordingly, user involvement is high, as users are integrated into the entire innovation process as active partners. The need for regulation is usually lower than with sandboxes, as the focus is on interaction rather than legal exemptions.



**FIGURE 32: COMPARISON OF INNOVATION ECOSYSTEMS: DIFFERENTIATION BETWEEN TESTBEDS, REGULATORY SANDBOXES AND LIVING LABS WITH REGARD TO FOCUS, USER PARTICIPATION AND REGULATORY NEEDS.**

Furthermore, a methodical structure for the setup of a successful Living Lab was outlined, ranging from goal definition and partner selection to the establishment of infrastructure and a final evaluation. Various practical examples served as illustrations, such as an AI sandbox project for the tourism sector in Tenerife, the EU project DALi Lab in the field of drone-based health logistics, and the development of a regulatory framework for testing environments in Barcelona. In summary, the presentation highlighted that Living Labs are a crucial instrument for bridging the "Valley of Death" between prototyping and market launch by enabling the simultaneous validation of technical, social, and regulatory factors.

## 6.2 Workshop Session Day 1 of the study visit in Spain

The first day of the study visit in Spain opened with a comprehensive introduction to the SIXFOLD project. The session covered the project's core objectives, progress made during previous visits, and the roadmap for upcoming tasks. A key element of this introduction was the analysis of feedback from past study visits to ensure continuity and focus. This was followed by a round of introductions where participants shared their specific expectations for the event.

Following the initial presentations and site visits, the workshop sessions commenced, utilizing the "Solution Design Canvas" via Miro boards and physical whiteboards. The first session aimed to empathize with stakeholders and identify existing barriers, while the second focused on defining strategic pathways. To facilitate in-depth discussion, the participants were divided into two specialized groups:

**Group 1** addressed the **skills gap hindering Digital Twin** adoption in the agri-food sector. Building on feedback from the Kortrijk visit—specifically regarding employee reluctance and mistrust of new processes—the group explored how Living Labs can serve as knowledge hubs. Key areas of focus included:

- Identifying critical technical, analytical, and operational skill shortages.
- Mapping stakeholders to determine who requires training (SMEs, technicians, managers) and which entities (universities, tech providers) are best suited to deliver it.
- Developing practical solutions such as training programs, internships, and partnerships with European Digital Innovation Hubs (EDIHs).

**Group 2** focused on **data access, quality, and cybersecurity**, building on feedback from the Kortrijk study visit regarding high data volumes, transfer errors, and legal hurdles. The group explored strategies to overcome these barriers, aiming to treat digitalization as a core component rather than an extra layer of complexity. Key points included:

- Identifying SME concerns regarding intellectual property loss, GDPR compliance, and data misuse.
- Exploring technical safeguards such as secure sharing platforms, data anonymization, and federated data models.
- Addressing data quality challenges, including sensor reliability, standardization, and the risk of sensor drift.
- The importance of visualization tools to make data sets more accessible and actionable for SMEs.
- Defining the role of Living Labs in establishing trust through legal agreements, pilot projects, and secure "sandbox" environments for experimentation.

## 6.2.1 Group 1: Skills gap hindering Digital Twin

The primary focus of the first group was the development of a strategic framework for Digital Twin adoption and the role of Living Labs (LLs) as a bridge to the industry. To avoid misunderstandings between technical teams and decision-makers, a strict distinction was made between manual data exchange (Digital Model), one-way automatic data flow (Digital Shadow), and full bidirectional real-time synchronization (Digital Twin). A key takeaway was that all objectives must be translated into "corporate language" to ensure acceptance at the management level. In analyzing implementation hurdles, specifically within the Business Problem domain, the group identified four critical areas that currently hinder the digital transformation of SMEs:

**Technological Barriers:** These include insufficient data availability within SMEs and poor data quality—often described as "Garbage In, Garbage Out." A significant challenge is the lack of interoperability between legacy systems and new platforms, making seamless integration difficult. Furthermore, the complexity of the technology itself creates a high entry barrier for non-specialized firms, as the technical architecture required for a Digital Twin often exceeds the current digital maturity of many AgriFood businesses.

**Organizational Hurdles:** A lack of internal expertise and persistent silo thinking within departments often prevent a holistic approach. The group noted that unassigned responsibilities for the long-term maintenance of twin systems and a general reluctance to change—rooted in employees' fear of making mistakes, being replaced by new processes, or failing to adapt to digital workflows—are major internal blockers. This is often compounded by a lack of clear leadership regarding who "owns" the digital transformation within the company.

**Economic Factors:** High initial costs and time-intensive integration processes are balanced against a short-term ROI that is difficult to quantify. Many SMEs struggle with the "time factor," where the labor-intensive setup and ongoing management of a Digital Twin compete directly with daily operational tasks and urgent production requirements, making it hard to justify the diversion of human resources.

**Security Aspects:** This category encompasses both real cybersecurity risks and deep-seated psychological barriers. Concerns over losing intellectual property (IP), exposing sensitive business secrets, or losing control over proprietary production data when sharing it across external networks often lead to a "wait-and-see" attitude, preventing SMEs from engaging in open innovation ecosystems.

To address these obstacles, Living Labs act as mediators and secure testing environments. Through pilot projects in agriculture and production—such as the transition from manual monitoring to robotic control in "digital orchards" or the optimization of factory layouts to save energy and space—tangible economic benefits are demonstrated. "Quick wins," such as automated temperature monitoring in autoclaves or pH-level control in batch processes (e.g., for salami production), serve as vital evidence of immediate profitability and quality assurance.

Finally, the group emphasized the importance of transparency and public engagement. By using gamification (e.g., soil health kits in schools) or digital twins that visualize food production for consumers, trust in the technology and the product is built. Strategically, financing should target areas where risks for SMEs are highest, while a proven ROI should eventually pave the way for long-term self-financing.

### **6.2.2 Group 2: Data access, quality, and cybersecurity**

On the first day, the group engaged deeply with the realities of SMEs in the agri-food sector. A central outcome was the deliberate decision to remove the term "Digital Twin" from the focus, as it appeared too abstract and fraught with technical barriers for many businesses. Instead, the work concentrated on the fundamental "business problems" that precede any digitalization. The analysis identified three detailed problem areas:

**Challenges in Data Sharing:** The willingness to share data correlates strongly with the competitive pressure in the respective sector. Data is understood here as a critical business asset that is treated with extreme caution.

- **Psychological Barriers & Mistrust:** There is a deep-seated skepticism toward external actors. The "Casa Xanceda" example illustrated that SMEs are reluctant to provide data to individuals or institutions with whom they do not have a personal relationship of trust—even when official certifications are present.
- **The "Cloud" Paradox:** The term "Cloud" often acts as a deterrent. It is immediately associated with cybersecurity risks and a loss of control, triggering proactive defensive reactions.
- **Fear of Misinterpretation:** SMEs fear not only the theft of data but, above all, that their raw data will be analyzed without the necessary context. This could lead to false conclusions by third parties, damaging the company's reputation or giving competitors unwanted insights.

**Data Quality and Collection:** The group established that a digital model can only be as good as the data that feeds it. Tangible operational problems came to light:

- **Technical & Economic Hurdles:** Discussions included high error rates in data transfers and the problem of "sensor drift" (the declining accuracy of sensors over time). Furthermore, for many SMEs, the question of affordability arises: are specialized agricultural sensors economically viable?
- **Misalignment of Expectations:** A gap often exists between theory and practice. What IT expert teams plan as "efficient data collection" is often difficult to implement in the hectic and unpredictable daily routine of an agricultural business.

**The Living Lab Environment:** The role of Living Labs (LLs) as neutral testing environments was critically examined:

- **Public vs. Private:** There is significant concern that sensitive process data within a Living Lab's infrastructure could become visible to unauthorized partners or even the public.
- **Added Burden instead of Relief:** Digitalization is often perceived as an "extra layer"—an additional layer of work that complicates the actual process rather than simplifying it.

As a consequence of these findings, the group defined a radical shift in direction for further work. Communication must move away from technical features and toward tangible business outcomes. The guiding principle was formulated as "turning data into gold": the focus is on proving, through measurable Key Performance Indicators (KPIs) and real-world best practices, that structured data utilization directly increases profitability. The technology itself should remain as invisible as possible in the background.

## 6.3 Workshop Session Day 2 of the study visit in Spain

The second day of the workshop began with a welcoming session and a recap of the previous day's outcomes. The primary aim of this initial phase was to summarize the key learnings from Day 1 and present the initial ideas developed within the groups. This provided a platform for interdisciplinary feedback and the prioritization of concepts, ensuring that the transition into deeper development was grounded in a shared understanding.

Following this collaborative review, participants returned to their respective groups to move from high-level concepts to practical execution through two core phases:

- **Ideate and Test:** Groups focused on generating specific solutions to bridge the skills gap and technological barriers identified earlier.
- **Define Concrete Actions:** The focus shifted toward establishing a clear roadmap, including identifying the necessary infrastructure and standardized service packages required for implementation.

This structured approach allowed the groups to refine their "Building Blocks" and prepare for the final "Commitment Circle," where the most viable prototypes were selected

### 6.3.1 Group 1: Skills gap hindering Digital Twin

On the second day, the group focused on how Living Labs (LLs) can make the Digital Twin "marketable" and understandable for SMEs. The role of the LL was refined as a neutral advisor and methodical partner, offering the efficient collection and contextualization of project data as a standardized service package.

**Solution Ideas and Strategies:** The group developed a broad portfolio of approaches to meet SMEs where they currently stand:

- **Methodology & Framework:** Development of a standardized method for data collection. A key offering for the food sector is the creation of a "Data Map" to specifically identify "white spots" (gaps) in a company's data landscape.
- **Decision Support & Self-Assessment:** Introduction of a recommendation list for SMEs to evaluate whether they truly need Digital Twin technology or if a Digital Shadow is sufficient. This process should ideally be guided by a facilitator.
- **Commercialization & Language:** LL services must be "easy to buy." This requires clear language (avoiding jargon) and addressing legal barriers to data sharing. The LL acts as a neutral advisor that also shares "bad results" and best practices.

- Infrastructure & Trust: Establishment of a data platform for exchanging experiences between Living Labs. This serves to convince governance bodies of the relevance and merits of these "Data Spaces."

The Digital Twin is fundamentally defined as a strategic Decision-Making System, designed to provide direct, actionable support to farmers in their daily farm management. Achieving this outcome requires a holistic approach that goes beyond technical implementation; a critical factor identified is the non-technological side of the acceptance curve, emphasizing the need for cultural and organizational readiness. Consequently, the success of these initiatives is measured through a diverse set of key metrics. These include tracking the increasing digital maturity of participating SMEs and the successful translation of deep-seated analogical knowledge into structured digital information. Ultimately, the impact is evaluated by the ability to maintain a sustainable balance between achieving a short-term return on investment (ROI) and driving long-term societal transformation within the sector.

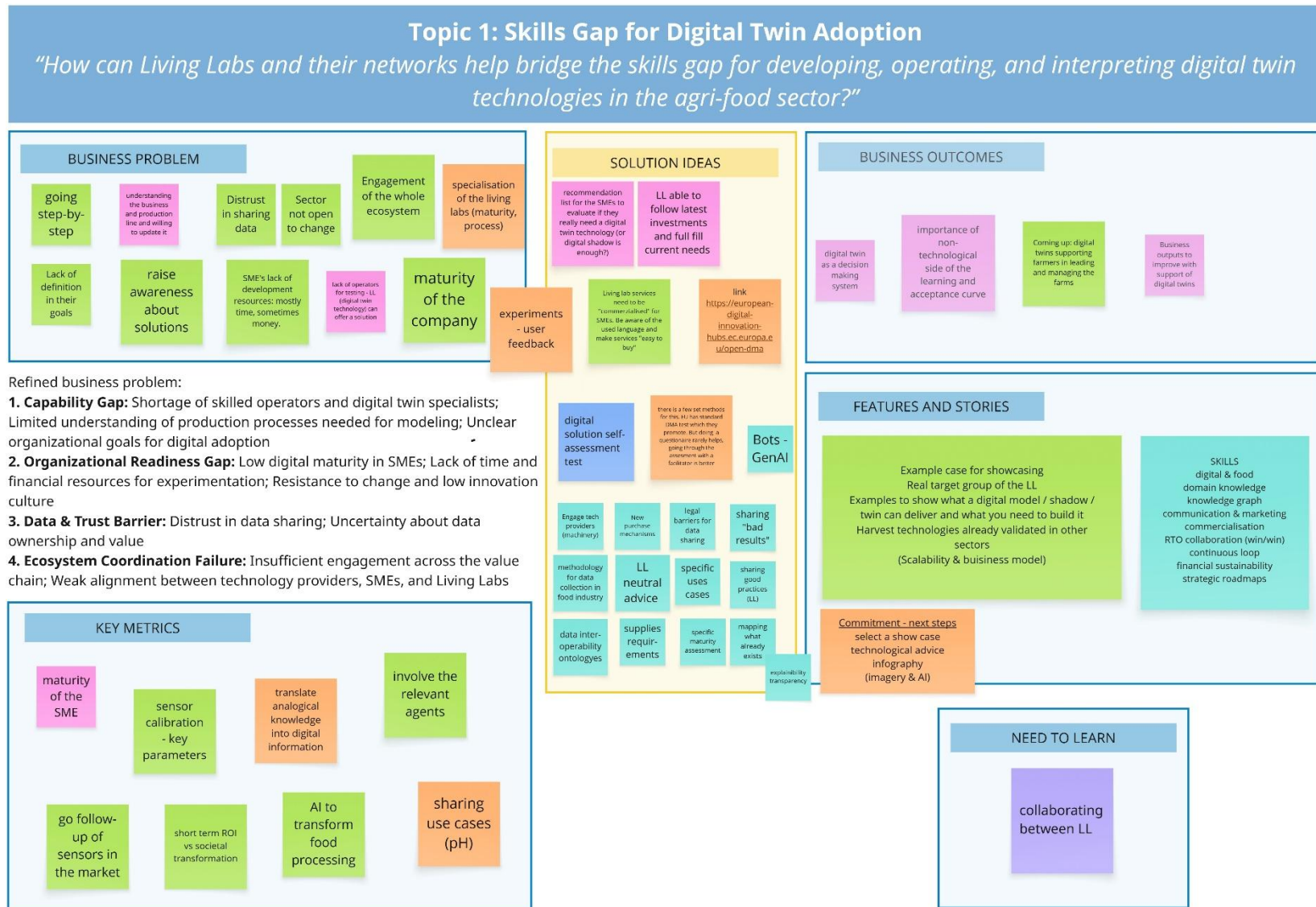
Features & Stories (Showcase Concept): The Showcase is central to communication as an illustrative process example:

- Showcase as a Demonstrator: Concrete examples are shown to demonstrate what a model, shadow, or twin can deliver. A key scenario is the Machinery Showcase: A company sets up a machine in the LL; via a Digital Shadow, other labs can assess its suitability before an actual investment is made. The LL acts as the bridge between machine manufacturers, sensor providers, and food companies.
- Skills & AI: Linking domain knowledge (food) with AI applications to transform food processing (e.g., sharing pH value use cases).

Commitment & Next Steps (The Roadmap): The following immediate actions were established:

- Inventory: Assessment of available data and machinery. Clarification of which data can/may be shared.
- Proof of Concept (PoC): Selection of a showcase using a simple product to demonstrate the path from data acquisition to refined utilization.
- Regular Reporting: Establishing a formal knowledge flow and reporting structure between Living Labs.
- Investment Incentives: Collecting best practices as "proof of security" to increase the willingness of SMEs to invest in future technologies.

In summary, the success of the strategy depends on the Living Lab's "translation performance." Showcases act as a "window of possibilities": they are not merely testing grounds but vivid process examples that demonstrate the actual structure and economic benefits of a Digital Twin to SMEs. By combining neutral advice, methodical data collection (Data Mapping), and technological demonstrators, the Living Lab provides the necessary security for digital transformation in the AgriFood sector.



**FIGURE 33: SOLUTION DESIGN CANVAS FOR GROUP 1: SKILLS GAP FOR DIGITAL TWIN ADOPTION**

### 6.3.2 Group 2: Data access, quality, and cybersecurity

On the second day, the focus shifted from problem analysis to the development of concrete Building Blocks. The objective was to position Living Labs (LLs) as trustworthy mediators and to establish digitalization as an integral part of business processes rather than an "extra layer."

Core Solutions and Strategic Building Blocks: The group developed a comprehensive set of technical and organizational tools to bridge the gap between technology and SME trust:

- **The Living Lab as a Neutral Trustee:** The LL acts as a "neutral intermediary" to reduce risk perceptions. It handles the legal clarification of data ownership—ensuring data collected on the premises of the SME remains their property—and guarantees that raw data remains private through "secure-by-design" channels. Transparency about usage and final goals is paramount; only refined learnings, not necessarily raw data, are shared.
- **Technical Standards & Integration:** To ensure system reliability, the group proposed using Asset Administration Shells (AAS) and standardized architectures (e.g., OPC UA). A multi-layered approach was defined, starting from sensors to an integration layer and finally a decision layer, with reference solutions available for each step.
- **Data Quality & Reuse:** LLs must define acceptable levels of data quality and implement "Data Quality Pipelines" (including semantic support and audits against sensor drift). A Solution Hub or "Toolbox" should be shared within the LL network, containing reusable building blocks and example data to simplify implementation across different use cases.
- **Maturity-Based Service Levels:** Digital maturity models are used for a gradual introduction. Crucially, the maturity level of the SME must correspond to the request and the specific solutions available at the LL. If an SME's maturity is too low to understand what a Living Lab offers, the LL must provide foundational support and clear "keywords" for the solutions offered.

The group established that the business case is the base and the essential starting point for any engagement. Success and progress are measured by:

- **Maturity Levels:** Tracking the digital maturity of the SME, specifically regarding available resources (personnel, budget) and available data.
- **Service Differentiation:** Acknowledging and measuring the very different levels of service provided within the Living Lab, tailored to the specific needs and readiness of the partner.
- **Quantifiable Gains:** Success is demonstrated through quantifiable Key Performance Indicators (KPIs) that prove the economic value of the data.

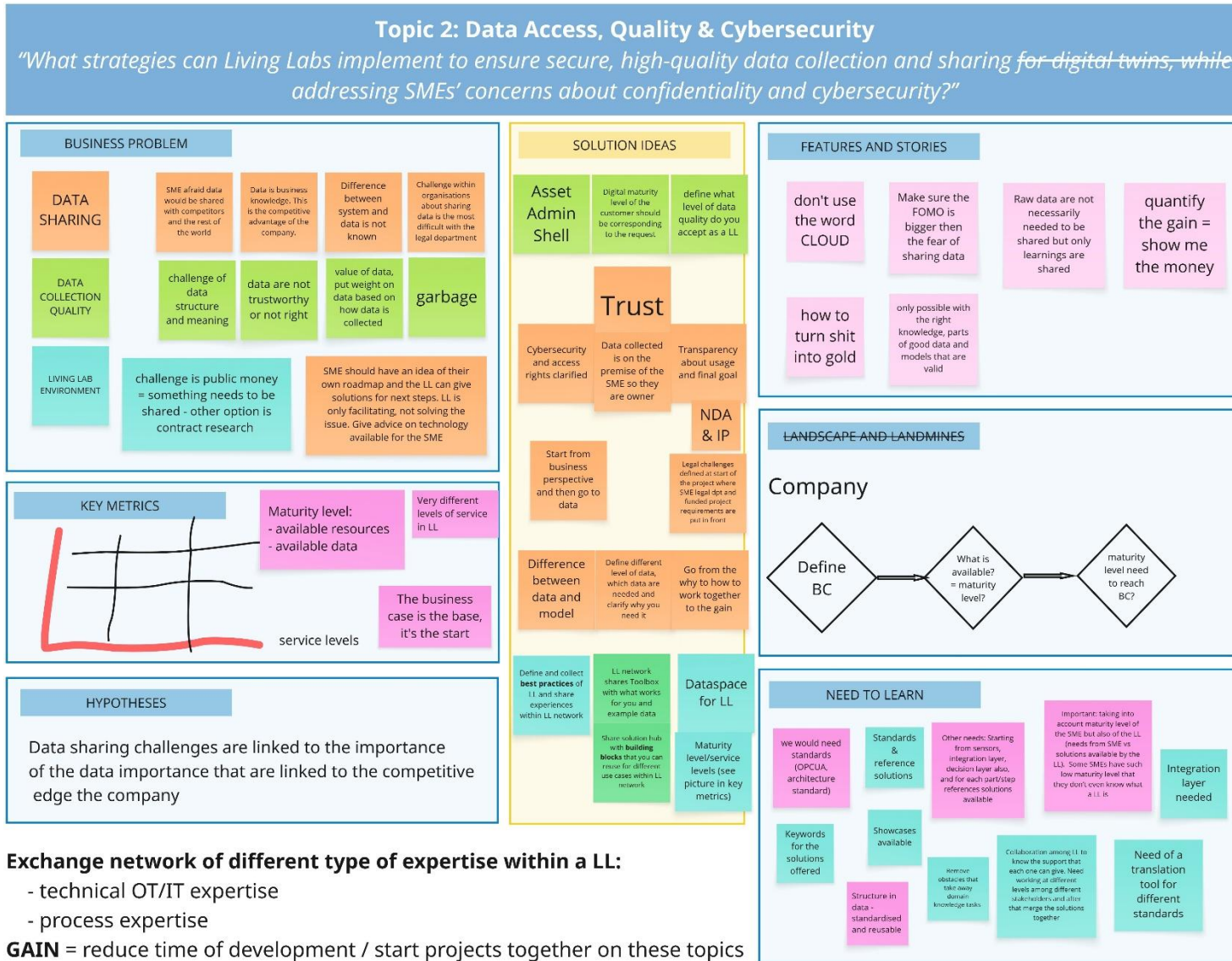
To increase adoption, the group emphasizes a radical shift in communication and value demonstration:

- **Communication Pivot:** Technical jargon, especially the word "Cloud," is strictly avoided. Instead, the focus is on a "business-first" perspective: "Go from the why to the how to the gain."
- **The "FOMO" Factor:** Marketing should ensure that the "Fear of Missing Out" (FOMO) becomes greater than the fear of sharing data. This is achieved by quantifying the gain—literally "showing the money" and demonstrating "how to turn shit into gold" through the right knowledge and valid data models.
- **Legal & Decision Security:** Legal challenges must be defined at the start of a project, aligning SME legal departments with funded project requirements. Showcases and a "translation tool" for different standards help remove obstacles that currently take away from essential domain knowledge tasks.

**Open Learning Areas and Next Steps:** Despite the solutions developed, the group identified critical requirements for future collaboration:

- **LL Network Collaboration:** There is a strong need for collaboration among LLs to know the specific support each one can provide. By working at different levels among various stakeholders and later merging these solutions, the network can create a more robust support system.
- **Standardization:** The industry requires architecture standards and a "translation tool" to navigate the variety of existing standards (e.g., OPC UA).
- **Minimal Viable Data Model:** Finding the smallest possible data model that remains functional and reusable across different agricultural use cases.

Data-sharing challenges are directly linked to the strategic importance SMEs assign to their data, which correlates with competitive pressure in their sector. Living Labs must therefore provide more than just technology; they must create a secure environment for experimentation (sandboxes), provide neutral advice, and foster trust by starting from a business perspective before ever addressing the data itself.



**FIGURE 34: SOLUTION DESIGN CANVAS FOR GROUP 2: DATA ACCESS, QUALITY, AND CYBERSECURITY**

## 6.4 Group presentation and Commitment circle

After the workshop sessions, both groups came together to present their results and discuss strategic synergies. This exchange and the subsequent "Commitment Circle" resulted in an ecosystem of modular solutions aimed at translating the abstract vision of the Digital Twin into tangible, secure, and economically attractive tools for SMEs in the AgriFood sector. The following six prototypes were identified:

**AAS Showcase:** Live visualization of machine data and documents

A demonstrator for the live visualization of machine data and documents based on the Asset Administration Shell (AAS).

- It serves as an essential decision-making aid for investments by providing a Digital Shadow that allows other labs to test the suitability of machinery before physical capital is committed.

**Agrifood Maturity Check:** Digital quick check to determine the digital maturity level

- A digital rapid assessment to determine the Maturity Level of SMEs.
- This check ensures that the technological complexity of a Digital Twin is tailored precisely to the available resources and the specific data landscape of the company.

**Value-to-Digital Twin:** An ROI calculator that assesses technical optimizations

- An ROI calculator that translates the economic added value of technical optimizations—enabled by a Digital Twin—into hard currency.
- It acts as a bridge to management by quantifying benefits according to the "Show me the money" principle.

**Data Map Navigator:** Strategic gap analysis for digital integration

- A diagnostic tool to identify "white spots" (data gaps) in the existing IT landscape.
- It creates a visual overview as a necessary roadmap for establishing the data foundation required for a functional Digital Twin.

**Neutral Trust Box:** Secure-by-design local data gateway

- A physical gateway acting as a neutral intermediary, ensuring that sovereignty over the raw data required for the Twin remains with the SME.
- It utilizes Secure-by-Design channels to overcome psychological barriers regarding "the Cloud."

**SME Solution Hub:** Repository for reusable LL building blocks

- A knowledge base for exchanging best practices and reusable solution components within the network.
- This enables the efficient scaling of proven Digital Twin scenarios across different businesses.

During the final plenary session, it was decided that the first three prototypes would be prioritized for intensive further development.

The justification for this selection lies in the necessary groundwork for successful Digital Twin adoption: while the Maturity Check meets the SMEs where they are and prevents technological overwhelm, the ROI Calculator provides the economic justification for implementing a decision-support system. Finally, the AAS Showcase forms the technological foundation, transforming the Digital Twin from a theoretical vision into a visually experiential and therefore trustworthy application. Together, these three tools form a "starter kit" that minimizes entry barriers and sustainably smooths the acceptance curve for complex digital representations in the agricultural sector.

## 7. Conclusions and strategic consolidation

The four study visits across Belgium, Finland, Lithuania, and Spain provided a comprehensive deep dive into the multi-layered challenges of the European Agri-Food ecosystem. While each visit focused on a specific thematic pillar, ranging from technical data management and novel food acceptance to financial sustainability and digital twins, the overarching learning is that digital transformation is not merely a technological task, but a communicative and organizational one. Living Labs have proven to be the essential "neutral intermediaries" required to bridge the gap between high-level innovation and practical SME adoption. Prototypes developed from the study visits are shown in the following illustration.



**FIGURE 35: PROTOTYPES DEVELOPED DURING THE FOUR STUDY VISITS.**

To translate these findings into actionable insights, the following summary table categorizes the primary outcomes of each study visit. By aligning specific barriers with identified solutions and recommended actions, it provides a structured roadmap for future activities and highlights the areas where the SIXFOLD network can continue to drive impact.

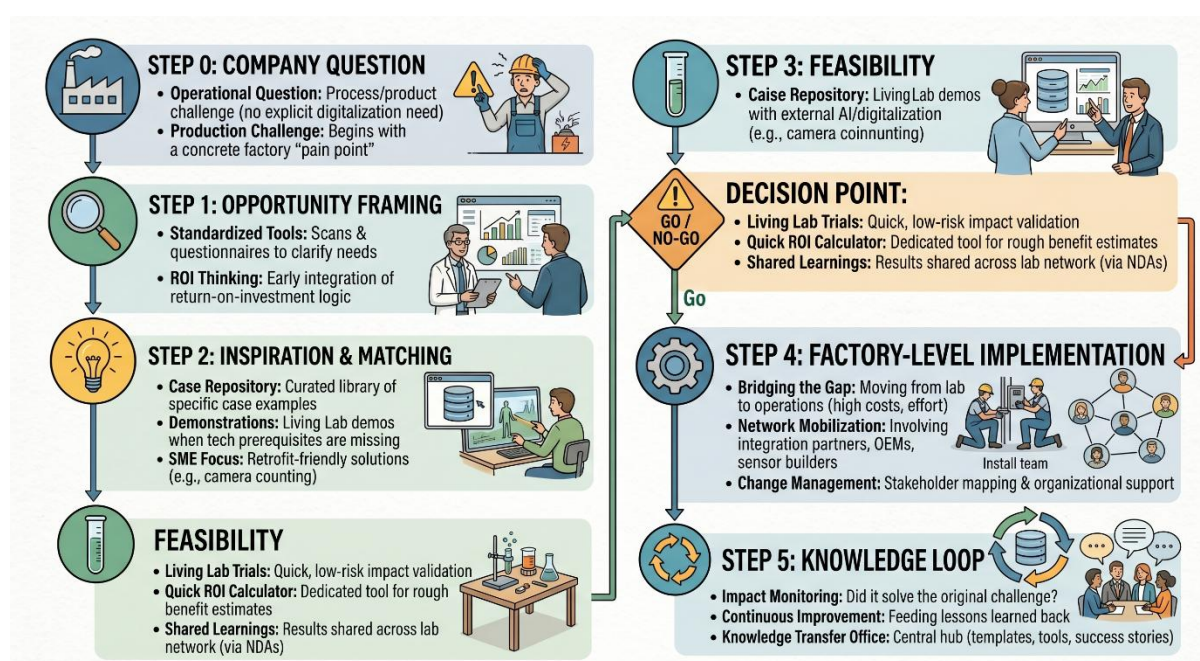
**TABLE 1: KEY INSIGHTS AND RECOMMENDED ACTIONS**

<b>Topic</b>	<b>Subtopic</b>	<b>Barriers</b>	<b>Potential Solutions &amp; Recommended Actions</b>
Digitization and data management	Strategy and infrastructure	Lack of data strategy; high investment costs for infrastructure; shortage of skilled workers at the interface of IT and food technology.	Development of clear digitalization roadmaps; use of living labs as "tech lanes" for testing; promotion of interdisciplinary exchange.
Novel Food and Food Innovation	Acceptance & Precision Fermentation	High regulatory hurdles for market launch; lack of acceptance among end consumers.	Conducting tastings and product tests in living labs to increase trust; supporting SMEs in regulatory processes.
Financing & Networks	Willingness to invest in Living Labs	Gap between research and market readiness; dependence on project-based funding.	Introduction of the "Investment Readiness Kit"; establishment of professional standards for Living Labs; transparent storytelling for investors.
Digital Twin	Implementation & Data Security	Skills gaps; technical hurdles in data quality and cybersecurity.	Use of Asset Administration Shells (AAS); implementation of "secure-by-design" channels; visualization of ROI through physical showcases.

## 7.1 Pilot Test: Digitalization as a Service (DaaS)

A core finding from the study visits was that SMEs often approach Living Labs with operational challenges without initially perceiving them as digitalization tasks. To bridge this gap, the decision was made to further deepen the "Digitalization as a Service" (DaaS) concept as a strategic focus. The objective is to test this model more rigorously to establish a standardized, low-barrier pathway that guides companies from their initial challenge to a scaled solution.

Based on the insights gathered during the study visits, a structured five-step journey was developed. This framework is designed to make digitalization projects measurable and to significantly reduce the risk for SMEs. The following diagram visualizes this process, which serves as the foundation for further testing activities.



**FIGURE 36: STEPS LIKE HOW DIGITIZING AS A SERVICE CAN BE IMPLEMENTED**

This pathway, which forms the basis for further refinement, structures the service into the following phases:

- **Intake & Challenge Definition:** In this phase, standardized scans and questionnaires are tested to accurately translate operational problems into technical requirements and to define the baseline.
- **Inspiration & Matching:** This step explores how case studies, technologies, and the expertise within the Living Labs can be strategically used to inspire companies, clarify technological prerequisites, and identify the most suitable tools.

- **Feasibility & ROI Validation:** A particular emphasis of the further deepening lies in the development of a Quick ROI Calculator. The goal is to test methods for reliably predicting economic benefits and the Return on Investment (ROI) during the early feasibility phase in the Living Labs, providing hard facts for the implementation decision.
- **Implementation & Scaling:** This phase evaluates how efficient collaboration with regional partners (OEMs, integrators) can be structured to ensure that prototypes successfully tested in the labs are seamlessly transferred into industrial daily operations and scaled effectively.

To establish DaaS on a permanent basis, the structure of a Knowledge Transfer Office (KTO) is also being tested. The aim is to build a searchable repository that bundles expert knowledge, feasibility results, and best practices. This involves examining legal frameworks and templates that enable knowledge sharing between Living Labs while strictly maintaining the confidentiality of company data.

This deepened testing approach ensures that digitalization is no longer perceived as an abstract hurdle for SMEs, but as a calculable and guided service that contributes directly to increasing process efficiency and sustainability.

## **7.2 From knowledge exchange to networked innovation: The path to the Meta Living Lab**

The deliberate decision to focus on different areas during the study visits was crucial for mapping the entire spectrum of the food value chain, from technological issues like digital twins to consumer acceptance. This diverse approach allowed for the integration of specific regional strengths into a broader European perspective. It was important to identify the extent to which Living Labs can help drive innovation in companies and in which direction the Living Lab ecosystem can develop.

The consistent application of design thinking and co-creation enabled us to move beyond mere problem-solving: the involvement of various stakeholders fostered out-of-the-box thinking, helped avoid tunnel vision, and, above all, created a foundation of trust between research, industry, and policymakers. The Solution Canvas proved to be a particularly effective tool, as it helped to directly translate the challenges identified in the workshops into structured concepts. In addition to the workshop sessions, the program offered in-depth insights into the Living Labs and the regional economy. Keynote speeches and networking events complemented the company visits and fostered diverse exchange.

Building on these results is the foundation for the establishment of a permanent Living Lab network. The transition from study visits to a permanent partnership is a multi-stage process, beginning with interviews and online meet-and-greets for new partners. The goal is to establish a solid foundation for the collaboration through a shared Living Lab Handbook and a Memorandum of Understanding (MOU).

The developed prototypes play a central role in this process. They not only serve as showcase results but are also continuously refined within the network as "living prototypes." Continuous feedback loops and the exchange of best practices between locations ensure that these solutions are jointly developed to market maturity.

In the long term, the network will function as a "Meta Living Lab," extending beyond the boundaries of individual projects. A shared innovation and investment agenda avoids redundancies in technical equipment and sustainably increases the strategic competitiveness of the participating regions. The network thus ensures coordinated planning that permanently combines technological excellence with practical application.

## **ANNEXES**

ANNEX 1 – Workshop notes from the Workshops held in Belgium

ANNEX 2 – Survey: Study visit Belgium

ANNEX 3 – Workshop notes from the Workshops held in Finland

## **ANNEX 1 – Workshop notes from the Workshops held in Belgium**

### **Day 1**

#### **GROUP 1**

#### Identify problem / challenge

➔ Who is involved? – Affected – part of the solution

#### **1. LACK OF DATA STRATEGY (food related) “at company level (SME)”**

- IT-department / IT-responsible (in combo with consultant)
- Management / CEO
- Sales
- Operators/operations
- HR/ institutes
- Living Labs
- Government (EU data Act...)
- Associations
- Suppliers / resources
- Buyers (B2B for sure – B2C?)

Who is not involved?

**Conclusion = A whole “ecosystem of data”**

#### **2. When does it become a real issue?**

- If it affects a / your business opportunity  
Food safety      Cyber security act      Request from big companies from retail

##### 2a. processes

- Production / operations
- Sales / marketing
- Procurement
- HR

- FINANCE!

##### 2b. impact

- Less selling / business
- Waste
- Bad reputation
- Less efficient

##### 2c. goals hindered by

- Growth, expansion
- funding
- Twin transition
- Sustainability

### **3. How can we make the problem worse**

Not collection data  
Not analysing the data  
Waiting -> not starting small (problem is too big to handle)  
Only discuss with management, not operators  
Not investing in sensors  
Not investing time -> not prioritizing  
Tax data sharing  
Not hiring the right skilled people  
Not asking for help (associations, initiatives of federations, clusters, ...)  
Not working cross – border / no partnerships  
Forget the people  
Old equipment  
Lack of training

### **4. Underlying structures / causes (Dot voting)**

Lack of Action    ●●●●●●●●

People skills    ●●●

Comms strategy    ●●●

Investments    ●●●●

**GROUP 2**

Data strategy (lack of)  
Costs  
Retro fitting  
standardisations, frequency

Different users



Different knowledge levels



*How might we include all stakeholders (operators)*

Different tools / software



*How might we create a checklist for data*

---

Lack of standardizations



You only get out what you put in



Not sure what to do with the collected data



Lack of data quality



*How might we know what we need (data)*

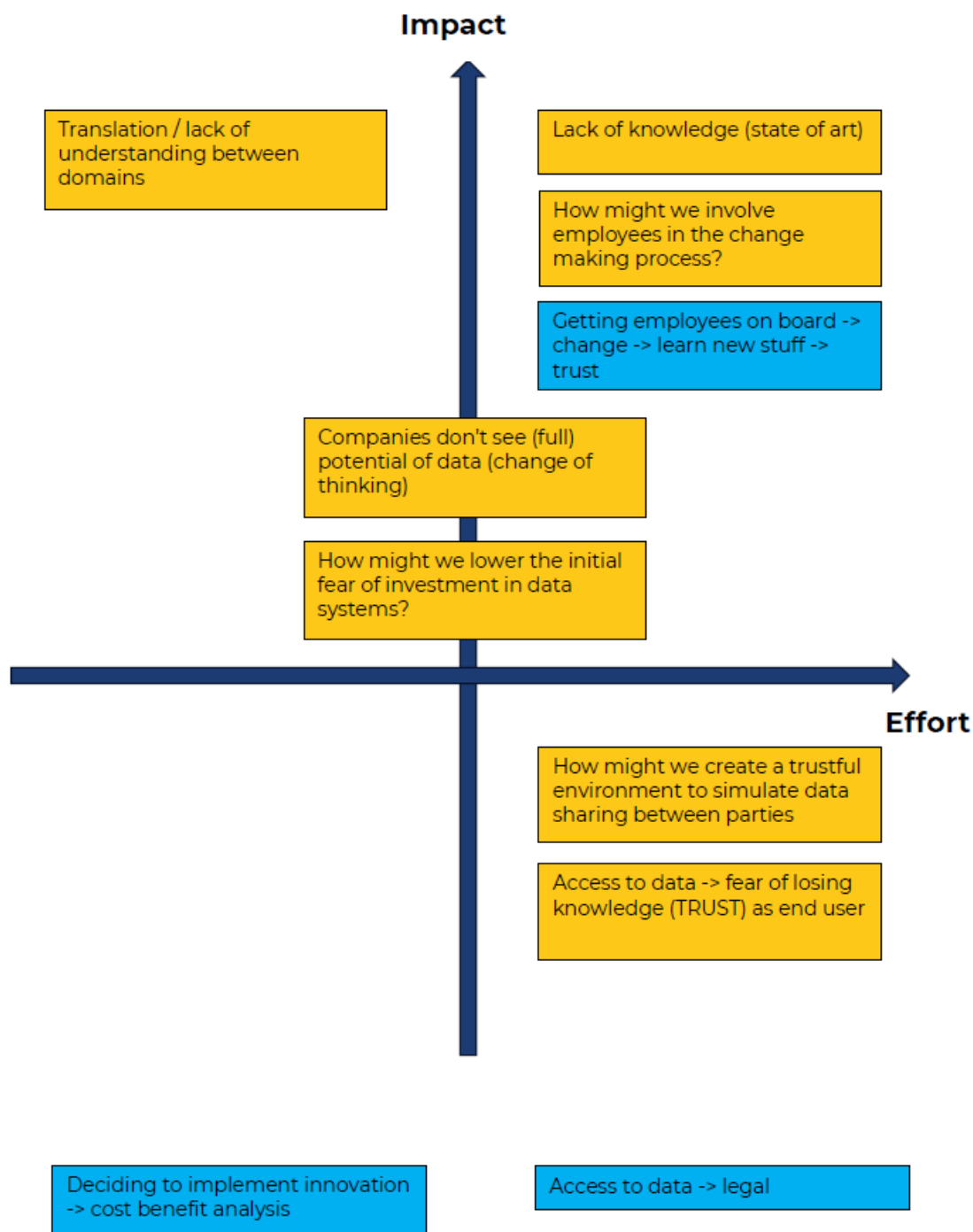
Different Aims Lack of trust



Different business models



*How might we create a common ground (for sharing)*



How might we make that sufficient knowledge on the living lab is present? ●

**HARDWARE**

- ↳ Devices
- ↳ Connectivity
- ↳ Security

How do we know what type of knowledge we need? ●

**SOFTWARE**

- ↳ VISUALIZE
- ↳ INTERPRET, COMBINE
- ↳ DECIDE
- ↳ FORECAST



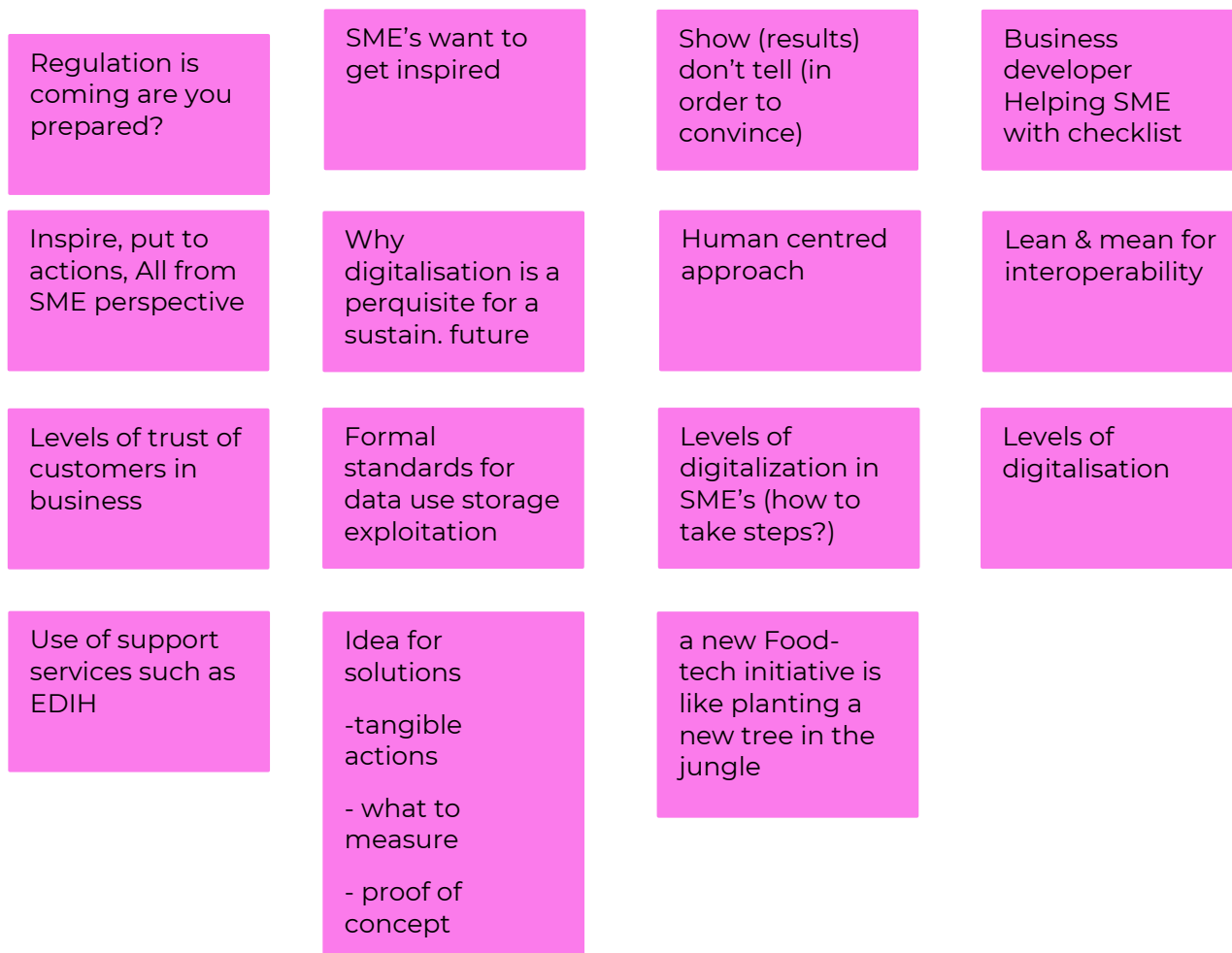
**GROUP 3**

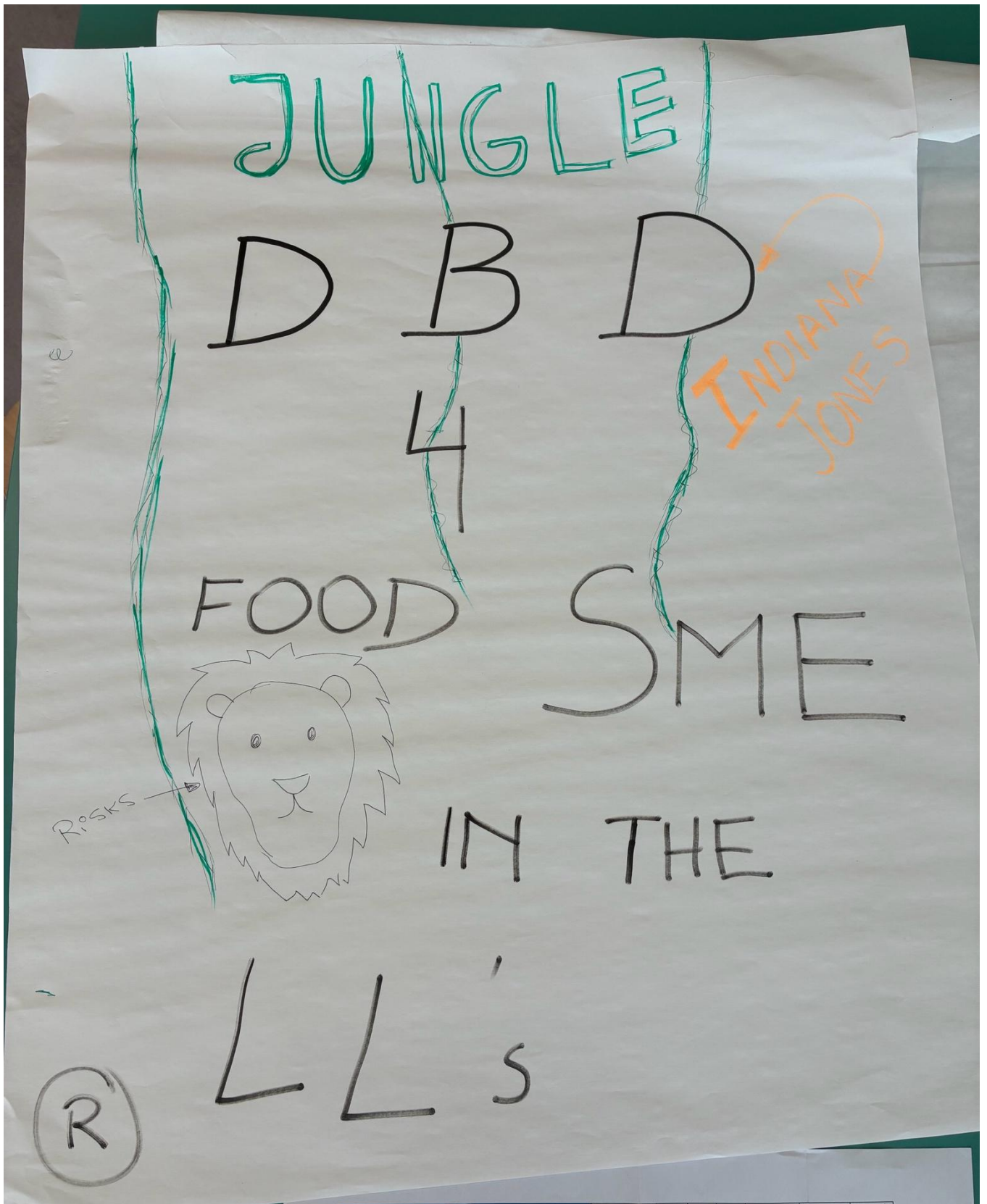
<b>Data visualization</b>	<b>Costs</b>	<b>Key metrics</b>
Cooperation SME's, LL's, research	Knowledge	SME competencies
Case study	Personnel	Skill set employees
DaaS	Technology doubts (RISKS)	Usability of Data
Start small, modular		ROI
		Expanding further by convincing the board and grant vouchers for SME's and LL's

## Day 2

### GROUP 1: Strategy for digitalization in Food Tech SME's

A plan of action designed to achieve a long term or overall aim





## Plenary feedback

### *Digitalization strategy for a food SME!*

- 1) Who
  - Digitalisation specialist?
  - Person
- 2) Really like the idea
  - Approachable solution
  - How to make it not to overwhelming?
    - > Taking businesses by hand
    - > LL are unique position know the new things coming but also talk to the SME's
- 3) You have seen Veg-i-tec how you see this function?
  - Digiscan proposed by FF
- 4) 1<sup>st</sup> should be for free
  - Where do they stand
  - What are usecases for you
  - Take them by hand to show solutions

Challenge -> training for DBD
- ➔ Aim is to have DBD in the LL so they have the knowledge of the (specific) sector.
- 5) What is the difference with an integration?
  - > it is not an integrator it is to inspire
- 6) FF is doing this – but it is not for free.
  - It takes 1 day (0,5 day for scan and 0,5 day for report)

↓

Funding of VLAIO we can offer it for €1200 not linked to living lab
- 7) In Flanders we have challenges to get SMEs to LL because they need to pay.

1e step = inspire = open the door

2e step = solution of FF Digi scan

- How often do you do today the service?
- Not easy to sell today. FF know for product not digitalization change.

## Commitment circle

- Similar approaches are existing & check what is + and – of these existing
- Do some testing with stakeholders

**GROUP 1: Roadmap for data(sharing) and DaaS activities in LL.**

*Problem*

Pushing technology/digitalization  
Different people from company in experiments  
Companies' com for different question (product/ingredient)

---

Show step by step -> adding value  
Lower barrier  
Start with easy step  
Add digitalization as an extra layer  
LL's as reference with tests/cases -> make them state of art/fit for purpose

*Need/landmine*

Security  
Explain end users about data use  
More services you offer -> more expensive (project) + more time required  
Difference between LL's  
No time for "extra's" -> funding for basis

**Food company**

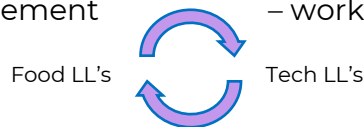
Test cases  
First steps -> step by step (what they can handle)  
Test-before-invest

**Tech provider**

Use/show capabilities -> ask in beginning  
Learn form question of end users  
Knowledge

LL's

Working together -> evolve quicker  
Complement - work with student



Need: remain relevant -> no extra -> need!  
Example

Role for this

Company x: ingredients + spices

Question: test recipe with more sunflower (extrusion)

Intake: talk about challenges -> product in value chain

Company details/type of machines/software

Structure



expectation: chat they want? How big?



Start project: data collected/ingredient

Focus on questions/be part of solutions (use sensors + machines you have)

Machine collects data -> students use data

-> External experts

End:

Show results on question they came with

Show them what you saw more

Dive deeper: STEP 2

### **Plenary feedback**

*DaaS activities in LL (add on as digitization in LL)*

How do the LL see this?

- LL want to give the best service to a company and data is part of this today

(Markus) Our LL purpose is education as mentioned  in LL is a challenge

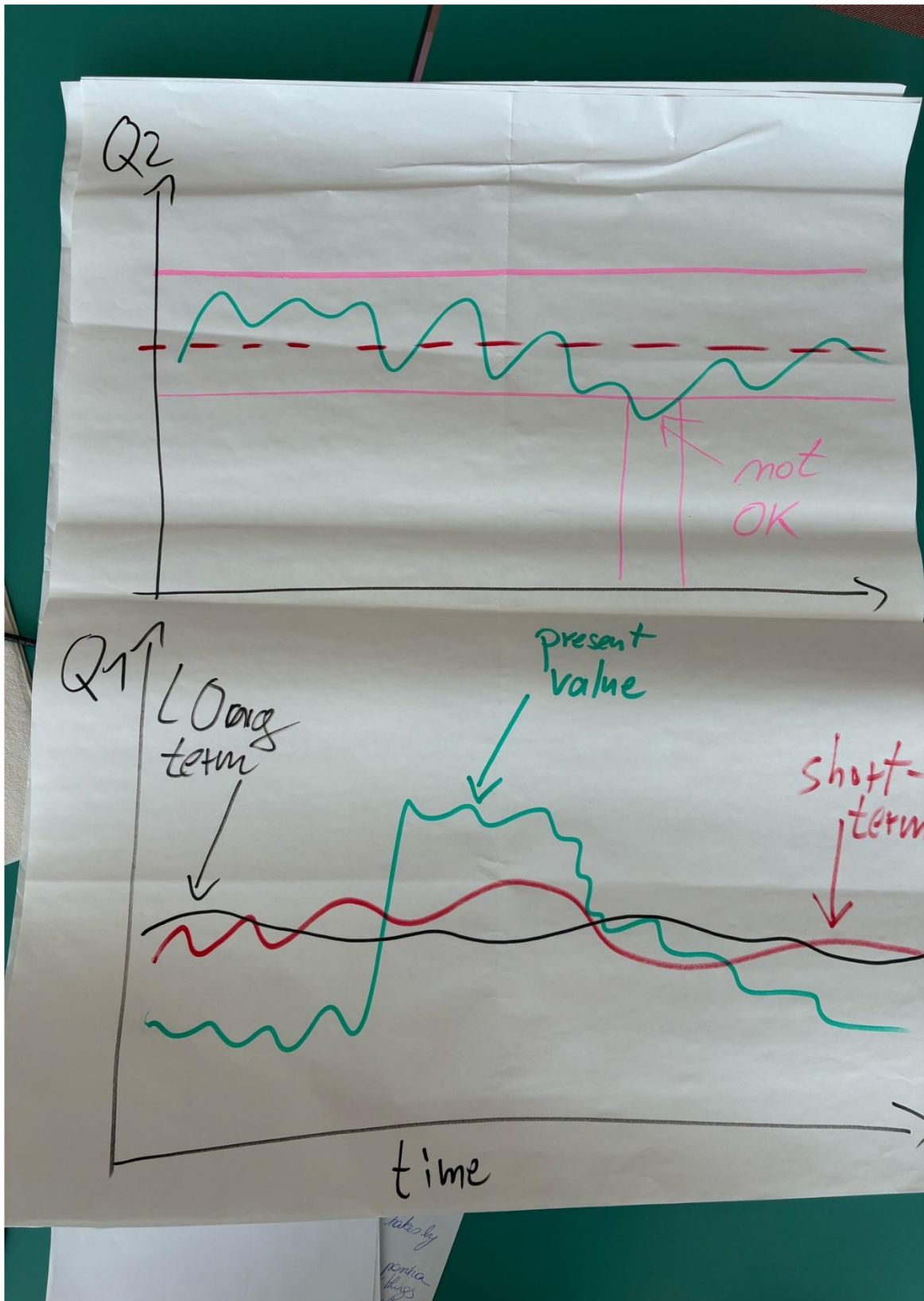
### **Commitment circle**

What could be the next step?

- How does the add-on look-like & reflect with SME's
- Promoting or convincing the people of the 4 LL to think about what they have now and how they can incorporate a digital service

Share the experiences of what we already have now

**GROUP 3: From data to actionable information**




## Plenary feedback

### *DaaS data to achievable information*

- Could it be possible to have these ... formats in the LL's
- Markus will try to make this happen on the refrigerator

## Commitment Circle

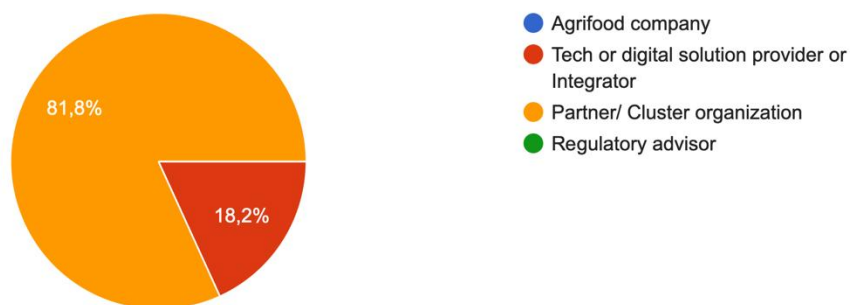
- How would it look like in the  LL's situation encountered by others to learn from each other?
  - Show how to do it and showcase what it can do & bring
  - Comment from Ari we thought about an open available dataset -> but soon it looked like a snowball because data -> metadata & no budget because too big but visualization is possible.
- What are the next steps?
- *Short article (Markus with the help of Ulrich)*

## ANNEX 2 – Survey: Study visit Belgium

We received 11 answers only

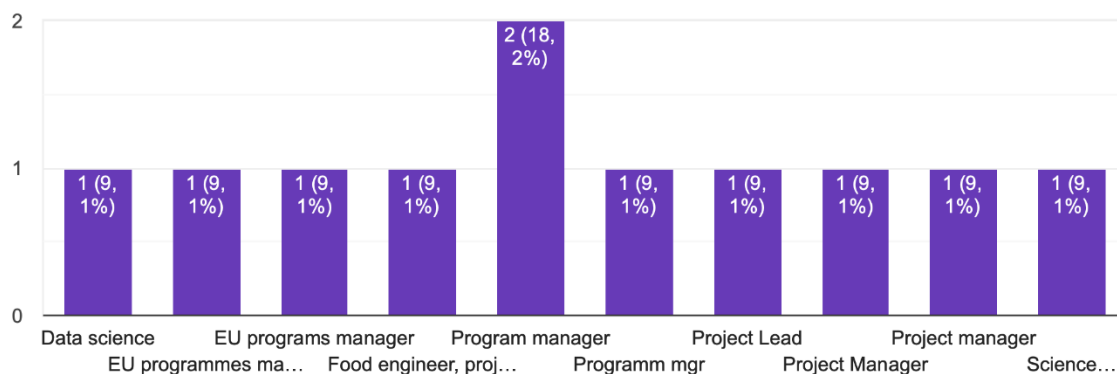
Choose your type of company are you active in.

11 antwoorden



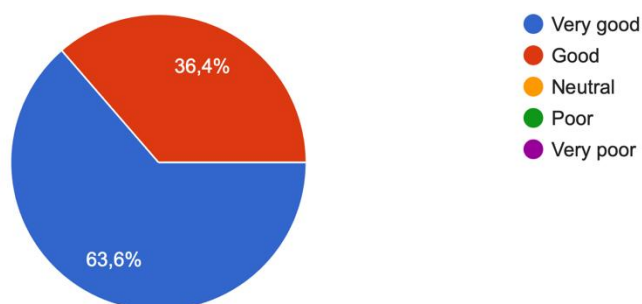
What is your function or profession

11 antwoorden



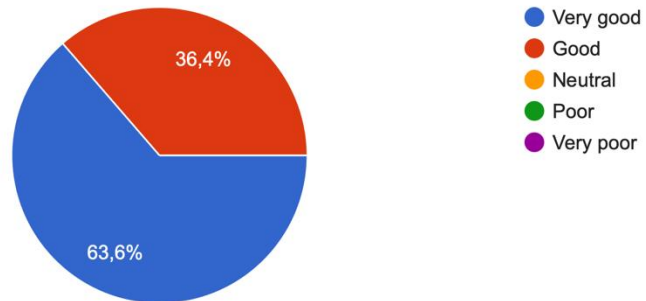
How would you rate the study visit overall?

11 antwoorden



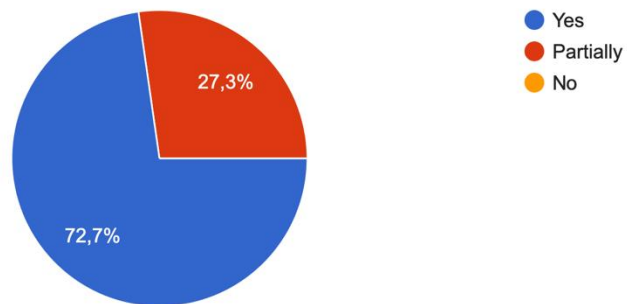
How would you rate the organization of the study visit?

11 antwoorden



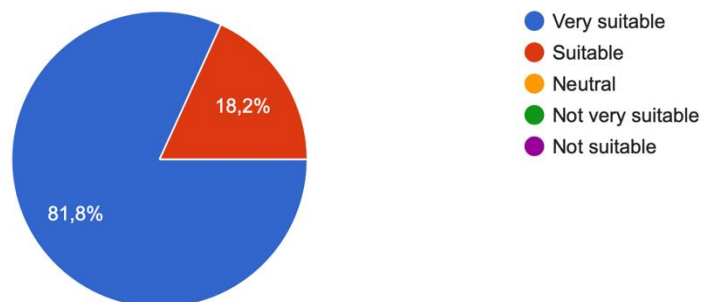
Was the information provided in advance sufficient?

11 antwoorden



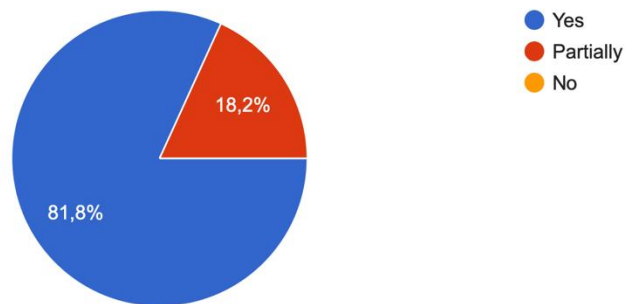
How would you rate the selection of Living Labs visited?

11 antwoorden

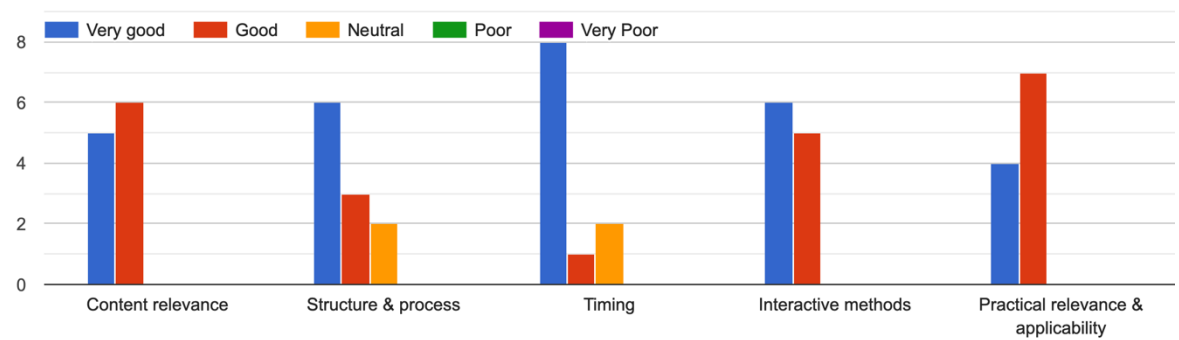


### Did the workshops meet your expectations?

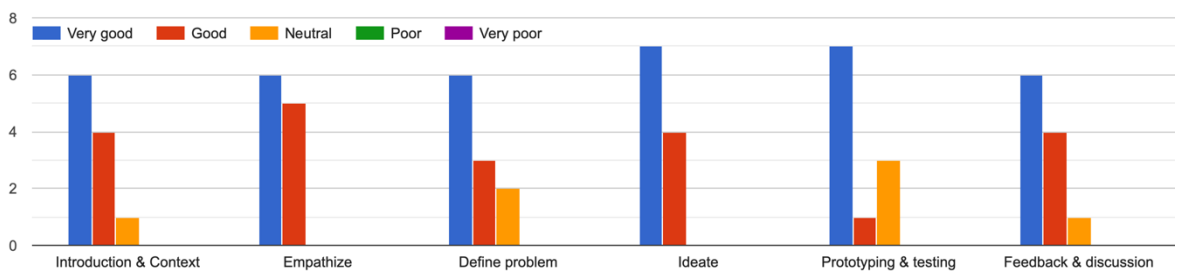
11 antwoorden



### How would you rate the following aspects of the workshops?

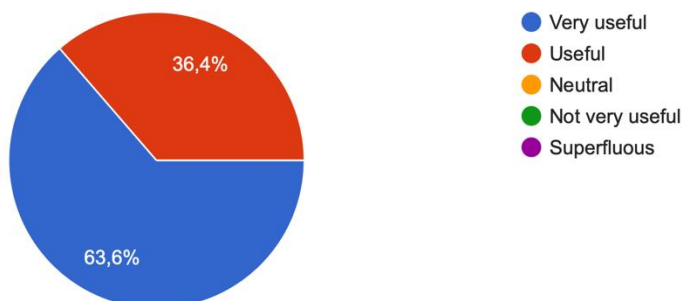


### How helpful did you find the individual workshop phases?



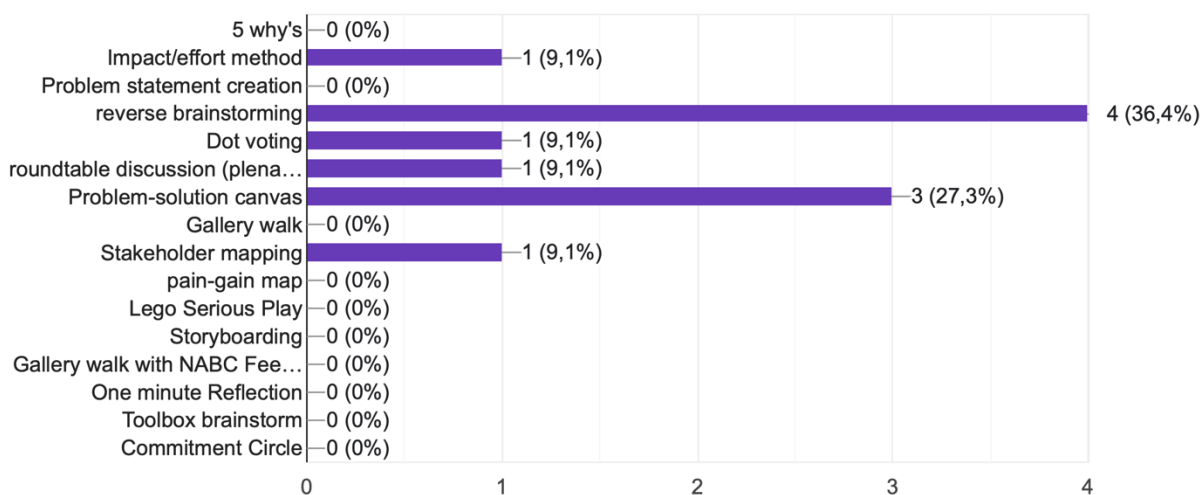
### How do you rate the use of the co-creation methodology in the workshops?

11 antwoorden



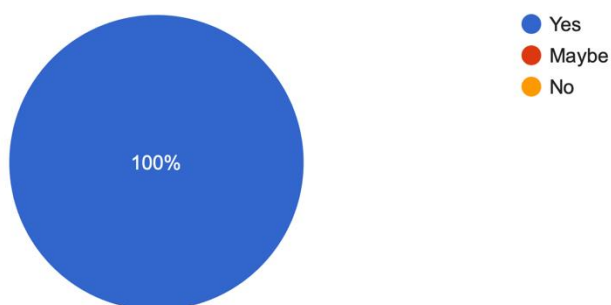
### Which methods did you find particularly valuable?

11 antwoorden



### Would you attend similar workshops in the future?

11 antwoorden



### **What did you particularly like?**

- Brainstorming among the participants
- Networking
- The interaction
- The people and the location
- Living labs
- The opportunity to learn about the needs (regarding data and/or digitalization) of AgriFood actors in other EU regions; and to dedicate to think about new solutions without the constraints of a call.
- Inspiration within the living labs, the group discussions and the challenges and opportunities of others
- Inspiring talks
- Practical in person demonstrations
- Open discussion
- Positive atmosphere, meeting new people. Getting inspired. Interesting visits

### **What could have been improved**

- Invitation extended not only to experts but also SME representatives to get to know deeper their needs, beliefs and expectations of Living labs
- No comment
- The density of the program
- Perhaps a tighter guidance on the topic, and shifting focus from SMEs to living labs / and how they came better help SMEs)
- Best is to have workshop in first part of day
- I'd have liked to have more information about attendants and entities, not just name, either during the introductions or beforehand (maybe you sent it to us and it was an internal delivery issue).
- Make the program a bit wider. It was quite tight, especially when the energy went down. It is hard to make it concrete
- Alignment of the Problems we want to solve
- For the co-creation part, provide optional (existing) concrete problems to solve. For a better focus during the task.
- Time to reflect and digest on outcome of brainstorm and workshops
- Company visits, before brainstorm

**What insights did you gain from the Living Labs?**

- Getting to know the degree of technology development and also examples of the application in different cases
- Best practices sharing
- Interesting
- Many! How to setup data sources, eee a proper digital twin in action etc.
- Ideas, how to create living lab in my institution.
- How others address similar needs, common and different approaches. I'd highlight that the SME ecosystem faces similar challenges around Europe.
- How they handle their data, how they are in contact with companies and help them (services), what infrastructure they have
- Inspiration on what is possible
- Factory and manufacturing examples and inner workings.
- There is more possible than we might think
- New tech, different governance, inspiration

**Do you have any suggestions for improving the co-creation methods?**

- No
- It would be very positive to invite also SME representatives to know their point of view about living labs. Do they know what a living lab is? Have they used a living lab before? What would expect from a living lab?
- A smaller selection might be better
- First to give some examples of implemented situations
- Encouraging the active involvement of all participants, building multidisciplinary teams.
- Less methods, scoping a bit more (more we went in all directions in the initial phase which made it harder to dive deep in a few topics).
- More guidance?
- Concrete problems to solve.
- N/a
- Fewer methods, more time. Document with context and common starting point

**What insights from the workshops will you apply in your work?**

- The importance of involving all possible stakeholders when defining the needs and services to be offered to SMEs
- Brainstorming
- X
- How to do timeseries
- Canvas
- New perspectives of common problems and needs, collaboration to build shared solutions, active listening and understanding.
- We will dive deeper in the digitization as a service
- Showcasing use cases
- Reverse brainstorming

**Were there any concrete solutions or approaches you would like to pursue further?**

- Increase the awareness about twin transition need for every enterprise, to accomplish government and law requirements and how Living lab could help/accompany in this journey
- No
- Problem solution canvas
- Time series article
- Creation of ecosystem in living lab
- I need to think deeper to answer this.
- How to create a layer on the food questions with technology
- Strategy for LL data management
- In general problem solving
- DaaS
- Not really

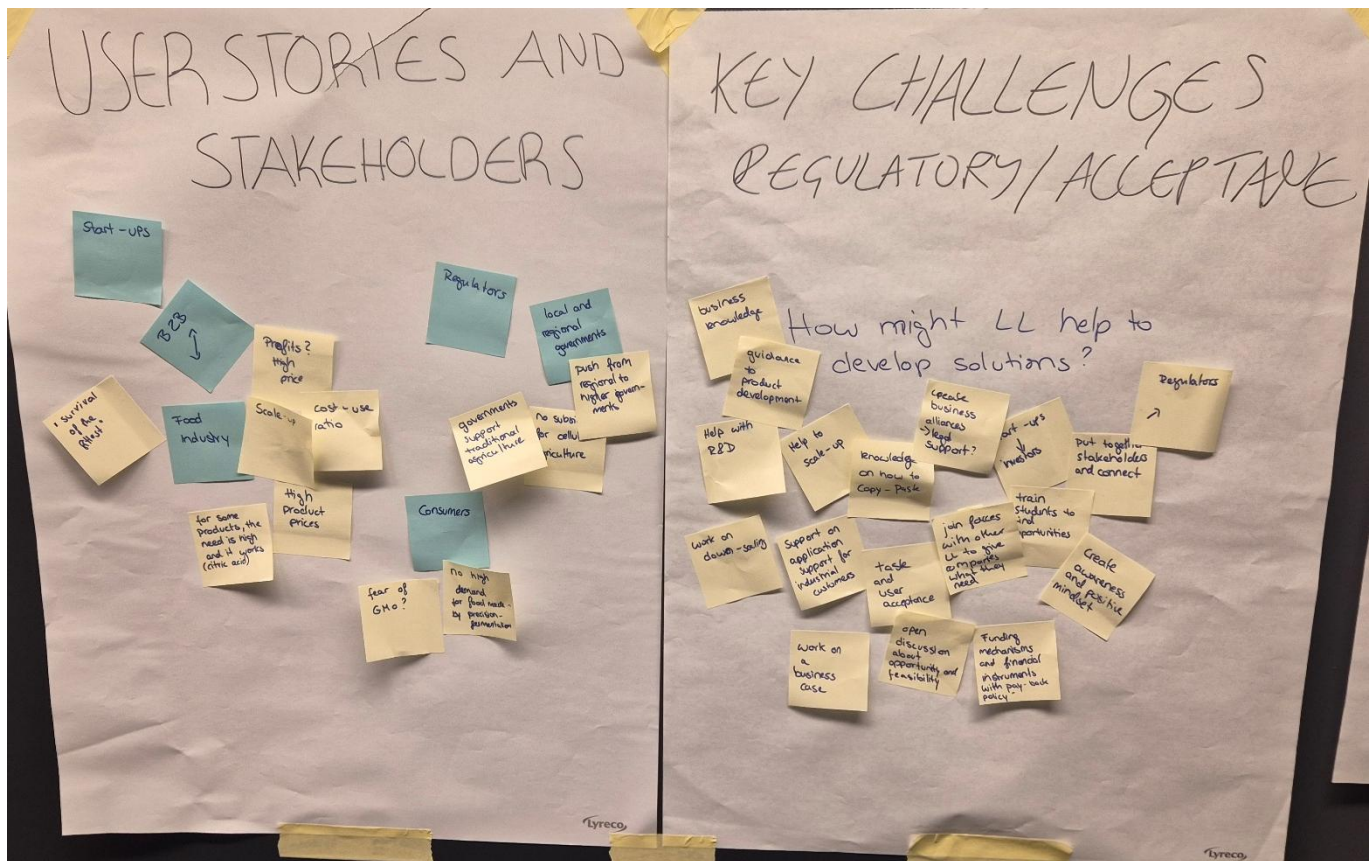
**Do you have any comments or feedback about the event?**

- No
- Good way for allowing growing ideas among different background people
- Great job!
- All was well organized
- It was a bit intense (all this kind of activities are). Having information in advance could help attendants to have more knowledge on the topic beforehand, but we would lose spontaneity.
- No. Thanks for Perfect Organization
- No more comments
- N/a
- Very nice! Great group

# ANNEX 3 – Workshop notes from the Workshops held in Finland

## Day 1

### GROUP 1



**GROUP 2**

# KEY CHALLENGES REGULATORY / ACCEPTANCE

**SOCIAL:**

- HYBRID FORMS
- WHAT IS YOUR END USER?
- EDUCATION ON FOOD / HOW
- CONSUMER ACCEPTANCE
- CONSUMER TESTING - NOT ALLOWED
- PACKAGING, LABELLING, NOMENCLATURE, MARKETING STRATEGIES

**REGULATORY:**

- SUBSIDIES NOT ALWAYS SUPPORTING SCALING - MONEY
- NARROWING TO PRECISION ALSO IN FUNDING
- RE-INVENT THE WHEEL → ⊕ LOOK OTHER COUNTRIES THAT ALREADY HAVE THE PRODUCT
- LACK OF SCALING DUE TO ⊕ FOR LIVING LABS
- METHODS / ANALYTICS MORE SENSITIVE → ⊕ BURDEN ↑
- REGULATORY PATHWAY → EFSA

**OTHER:**

- TECHNICAL → CORRECT PARAMETERS, SCALING UP SOURCE OF RAW MATERIALS, ENERGY INEFFICIENCY
- OPERATING IN SILOS / NOT MAKING FULL USE OF FACILITIES OR KNOWLEDGE OR ENGINEERS

## challenges + stakeholders

**Learning Forest**  
failing fast  
example: moon walk with multidisciplinary teams

**Stakeholders**

**Current:**

- researchers: computers (dev), tech/organisms
- pilot facilities: lean, EFSA
- tech prod: consumer, retail, food industry, regul., market, tech, equipment
- consumer: retail, regulators, marketing/sales, engineers

**Preferred:**

- research: company development, marketing
- tech prod: equipment, regulation
- pilot fac.: tech, consumer, retail, farm, Reg., market/sales
- regulators + consumer

**How:**

- facilitating multidisciplinary testing (pilot)
- future experience advances (strong belief)
- use examples from other countries that already have the product
- tech / small cohort - ethical trial

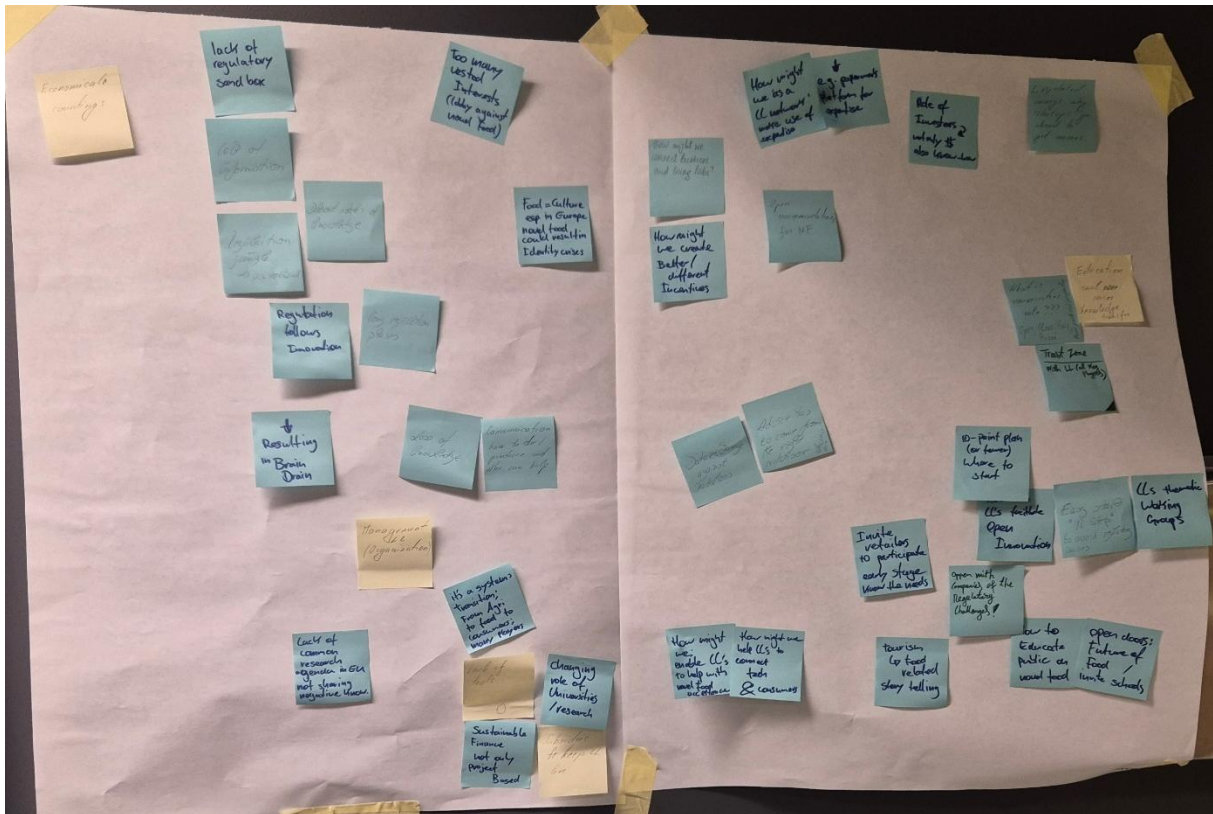
**Background of people:**

- pragmatic
- less legal
- more industry

**different language in policy makers and industry**  
→ ex. a present way of proc. from

**Now Classical**  
→ challenge!

**GROUP 3**



**GROUP 4**

