

D5.3 EVALUATION CRITERIA

Project: Monitoring of Environmental Practices for Sustainable Agriculture Supported by Earth Observation

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List of Abbreviations

A/A	Abbreviation	Description
1	AB	Advisory Board
2	BAP	Business Cases Action Plan
3	BC	Business Case
4	BCE	Business Case Evaluators
5	BCF	Business Case Facilitator
6	BIG	Business Cases implementation Guide Lines
7	CA	Consortium Agreement
8	Cbs	Certification Bodies
9	DP	Data Provider
10	EC	European Commission
11	EnU	End Users
12	EO	Earth Observation
13	EU	European Union
14	LHCs	Lighthouse Customers
15	Pas	Paying Agencies
16	PC	Project Coordinator
17	PP	Platform Provider
18	PSC	Product & Service Consumers
19	SOC	Soil Organic Carbon
20	SP	Services Provider
21	WP	Work Package
22	WPL	Work Package Leader
22	PMI	Project Management Institute
23	PBA	Professionals Business Analyst
24	CCLR	Collect Create Link and Rate
25	HE	Horizon Europe (Program)





Summary

WP5 main objective is to deploy, test and evaluate ENVISION data products and services developed in WP3 and WP4. More specific within WP5:

• **Products and services** developed within WP3 and WP4 **are used and tested under different conditions** by the Business Customers (BC) and the Lighthouse customers (LC).

• **Product and services are evaluated** for each business case individually and from three different perspectives related to:

• **The performance, usability and effectiveness.** We rate the ability of the product and services to cover PAs and CB's identified needs using co-developed criteria within WP2 describing user requirements (functional and non).

• **The business value and acceptance.** We evaluate product business value and acceptance for each business case, using criteria co-developed with the BC actors within the WP5 and indicators that quantify the business value and acceptance.



• The impact on an economic, environmental, and societal level.

Using impact indicators, we evaluate the impact at an economic, environmental, and societal level.

The products and services for each Business Case are evaluated within Task 5.3 using the evaluation criteria as a tool and performing meetings periodically to collect the indicator values during the project implementation.

To support the activities mentioned above and objectives, T5.3 identify and tailors a suitable methodology to support the co-development of the evaluation criteria. The methodology needs to formulate standard, accepted, suitable, and representative evaluation criteria for the a) business value and acceptance and b) economic, environmental, and societal impact.

Figure 1 presents the performing steps and working with the BCs actors in physical and virtual workshops; we collect their feedback, analyze the material and inputs, perform a consultation and finally end up with specific evaluation criteria presented in this deliverable.



Figure 1. Activities performed within 5.3

This deliverable briefly introduces WP5 and Task 5.3 (Section 1) and then describes the activities and results (Figure 1). Those are:

- The methodology (Section 2).
- The elicitation activities (Section 3).
- The analysis and processing of the elicitation results (Section 4).
- The consultation phase (Section 5).





- The evaluation criteria (Section 6).
- The conclusions and next steps (Section 7).





1 Introduction WP5 and Task 5.3

1.1 Envision objectives and the role of WP5

ENVISION overall objective is to fulfil the need for **continuous and systematic monitoring** of agricultural land, shifting the focus from fragmented monitoring limited to specific fields and dates (or time windows) to **territory-wide and all-year-round monitoring**. Acting as a trailblazer for organisations that monitor environmental- and climate-friendly agricultural practices stemming from EU policy, ENVISION will make use of heterogeneous types of available data (EO-based, in situ, open data, and historical on-field check data) and state-of-the-art technologies and methodologies (automatic pixel/texture/object-oriented change detection and classification methods, machine learning, data fusion, multi-source and multi-temporal data management) for providing **a fully-automated and scalable toolbox of products and services, built in close interaction with its future customers (Business customers¹, Lighthouse Customers²).**

WP5 main objective is to deploy, test and evaluate ENVISION data products and services developed in WP3 and WP4. In short, within WP5:

- **Products and services** developed within WP3 and WP4 are used and tested under different conditions by the Business Customers (BC) and the Lighthouse customers (LC).
- Product and services are evaluated for each business case individually.
- **Evaluation results** will be used to improve the data products and service (WP3 and WP4) and to support the commercialization and dissemination activities of the ENVISION project (WP6, WP7).

More specifically, the developed ENVISION platform, data products and services will be used and tested in various business cases under different conditions by the business case partners (the PAs and CBs) and the LHC. They will have the opportunity to use and test the services as close as possible to their actual business practices with the necessary support and guidance they need. This will allow them to gain experience and evaluate services, not in a limited time and environment, but in their actual work environment and a longer timeframe.

Therefore, the WP5 role is critical to ensure that the services are developed, reach the required maturity, and cover specific customer needs related to the Common Agricultural Policy (CAP).

1.2 Interactions with other WPs

The interactions of WP5 with the other WPs are described below (Figure 2):

• The identification of PAs and CBs needs occurs in WP2 Commercial Service Requirements. WP5 will consider user requirements identified in WP2 as a baseline for the performance, usability and effectiveness evaluation process. As we explain in section 2.1.3, the functional and the

² Lighthouse Customers which are not members of the consortium and are participating in ENVISION voluntarily.



¹ Business customers (ENVISION partners NPA, LV, CAPO, OCS), who are project partners and who will participate from beginning of the project to its completion.



non-functional requirements but also other types of requirements that WP2 has identified can support the evaluation process in terms of performance, usability and effectiveness.

- WP3 designs and develops the EO-enabled data products offered through the ENVISION platform while considering the end user needs identifying in WP2.
 The results of WP3 (data products) will be used and evaluated in WP5. WP5 will therefore identify the needed improvements and updates in the evaluation reports, considering identified needs and priorities (WP2), and provide them to WP3 actors in the evaluation reports, using the WP2 user stories as a baseline.
- WP4 designs and develops all aspects of the ENVISION platform. The identified end-user needs of WP2 feed into WP4, and there is an exchange of information among WP2 and WP4 as the platform and ENVISION service are **co-produced** with the end-users to ensure that they are tailored to their needs.

WP4 (services) results will be used and evaluated in WP5. WP5 will identify the needed improvements and updates in the evaluation reports, considering identified needs and priorities (WP2), and provide them to WP4 actors.

 WP5 evaluation results will be provided to WP6 and WP7 to support the commercialisation and dissemination activities of the ENVISION project.

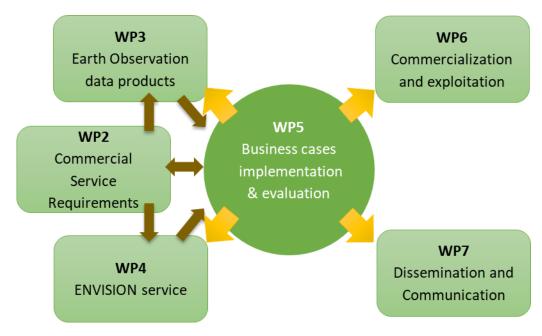


Figure 2 WP5 interactions



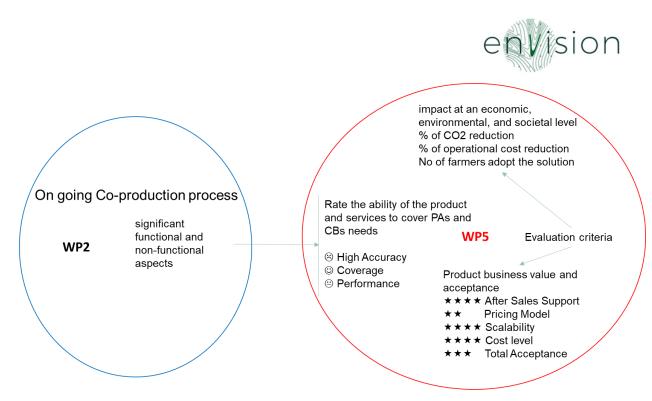


Figure 3. WP5 will use WP2 outcomes to rate the product and services' performance, usability and effectiveness.

1.3 BC Customers and their role in BC implementation and evaluation Process

During the business cases implementation and evaluation, the ENVISION products and services will be tested and validated by:

- Business customers (ENVISION partners NPA, LV, CAPO, OCS), who are project partners and who will participate from beginning of the project to its completion and
- Lighthouse Customers which are not members of the consortium and are participating in ENVISION voluntarily.

Two customer segments will be involved in the project:

- Paying Agencies using ENVISION to monitor environmental and climate requirements of EU policies related to agriculture, and
- Certification Bodies use ENVISION to monitor organic farming requirements.
- Farmers, through the mobile application
- Third parties (i.e. devs) through the Add-on development

Business customers act as business stakeholders and, therefore, actively develop the evaluation criteria. Both PAs and CBs will ensure the demand-driven design of the project services and their value proposition and help pave the way for their market acceptance and uptake after the project. The following tables provide a brief overview of the Business customers and their roles in the BC implementation and evaluation Process.

We need to mention that for the UK BC, a farm candidate has been identified to participate in the BC. We are awaiting confirmation from the farm on their decision to participate in the BC. Afterwards, the evaluation criteria for the UK Business Case will be defined together with UK BC actors.





Flemish Business Case: Monitoring the condition of the soil

Business Customer: LV Flanders (BE)

Type of organisation: Paying Agency (PA)

Short description: LV, the Flemish Department of Agriculture and Fisheries and Paying Agency, i.e. Flanders' official PA in charge of the financial support for agriculture and the implementation of CAP.

LV will participate in the business case titled "Monitoring the condition of the soil in Belgium" (WP5 – Business cases implementation and evaluation). The Belgian business case aims to demonstrate and evaluate how the use of EO-based services and Machine Learning techniques can increase the frequency, spatial cover, accuracy, and efficiency of the Flemish paying agency checks concerning the cross-compliance obligations related to soil management.

Table 1. Short description of the Flemish Business Cases customer.

Lithuania Business Case: Monitoring Multiple Environmental and Climate Requirements of CAP

Business Customer: NPA

Type of organisation: Paying Agency (PA)

Short description: NPA, the National Paying Agency under the Ministry of Agriculture of the Republic of Lithuania, i.e. the official PA of Lithuania that manages the financial support for agriculture and the implementation of the EU CAP measures.

NPA will be responsible for the Lithuanian business case (monitoring multiple environmental and climate requirements of CAP) and will participate in the implementation and the planning and evaluation stages (WP5 – Business cases implementation and evaluation).

Table 2. Short description of the Lithuanian Business Cases customers.

Cyprus Business Case: Monitoring Multiple Environmental and Climate Requirements of CAP

Customer: CAPO

Type of organisation: Paying Agency (PA)

Short description: CAPO, the Cyprus Agricultural Payments Organization, which is responsible for the management of CAP payments, i.e. the Cyprian PA.

CAPO will be responsible for the Cypriot business case (monitoring multiple environmental and climate requirements of CAP) and will not only participate in the implementation phase but also in the planning and evaluation stages (WP5 – Business cases implementation and evaluation).

Table 3. Short description of the Cypriot BC customer's.





Serbian Business Case: Monitoring organic farming requirements

Customers: OCS

Type of organisation: Certification Body (CB)

Short description: OCS, is the authorized control body that deals with the control and certification of organic products, i.e. the Serbian Organic Certification System.

OCS will be responsible for the business case regarding monitoring organic farming practices and will participate not only in the implementation phase but also in the planning and evaluation stages (WP5 – Business cases implementation and evaluation).

Table 4. Short description of the Serbian Business Cases customers.





2 Evaluation Methodology and Definitions

In this section, we will describe the applied methodology, providing the basic definitions and the glossary at the beginning. As presented in Figure 4, in the PMI Business Analysis guide, the Needs assessment and Solution evaluation, together with Traceability and Monitoring, are Key Activities in Business Analysis. Additionally, there is a link between the Needs Assessment and the Solution Evaluation that we have considered in our methodology.

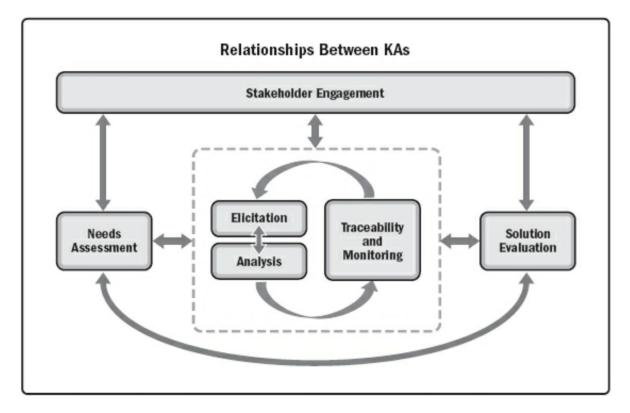


Figure 4. Needs assessment and Solution evaluation, together with Traceability and Monitoring, are Key Activities in Business Analysis. Source "The PMI Guide to Business Analysis"





2.1 Definitions and glossary

In this subsection, we summarise the basic definitions that the reader of this text can use as a reference.

2.1.1 Product requirements

According to the PMI Guide to Business Analysis, the product requirements are categorised into different types, as presented in Figure 5.

PRODUCT REQUIREMENTS							
Requirement Type	Definition	Example					
Business	A requirement that describes a higher-level need of the organization, such as a business issue or opportunity, the rationale for why an initiative is being undertaken, and a measurable representation of a goal the business is seeking to achieve.	Decrease CSR average handling time from 10 mins to 8 minutes within 6 months of project implementation.					
Stakeholder	A requirement that describes the needs of a stakeholder or stakeholder group.	CSR shall have the ability to apply for a credit card directly in the application portal.					
Solution	A requirement that describes the features, functions, and characteristics of a product, which will meet business and stakeholder requirements.						
Functional	A requirement that describes the behavior of a product.	System shall have the ability to prefill the customer demographics portion of the credit card application.					
Nonfunctional	A requirement that expresses an environmental condition or quality required for the product to be effective.	System shall be available 24x7.					
Transition	A requirement that is a temporary capability, such as data conversion and training requirements, needed to transition from the current as-is state to the future state.	Credit card application shall be deployed site by site.					

Figure 5. Product requirements types ³

Business requirement. Describes the higher-level needs of the organisation, such as business issues or opportunities, reasons why an initiative has been undertaken, and measurable representations of goals the business is seeking to achieve. Business requirements are used to provide context and direction for any solution so that the solution addresses the business need. Business requirements are typically defined before a portfolio component, program, or project has been initiated, as they represent the reason why the portfolio component, program, or project has been undertaken or why the product should be created or modified. Business requirements are often used to define the success criteria for the portfolio component, program, or project. An organisation may have multiple business requirements. All other remaining product requirement types—such as stakeholder, solution, and transition requirements—are typically defined within the context of a project.

Stakeholder requirement. Describes the needs of a stakeholder, where the term stakeholder refers to an individual, group, or organisation that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a portfolio, program, or project. Examples of stakeholders include customers, users, regulators, suppliers, and partners, as well as internal business roles.

³ The PMI Guide to Business Analysis (pp. 94-96). Project Management Institute





Solution requirement. Describes the features, functions, and characteristics of a product that will meet the business and stakeholder requirements. Solution requirements are further grouped into functional and non-functional requirements as follows:

Functional requirement. Describes the behaviours of the product. Examples of types of functional requirements include actions, processes, and interactions that the product should perform. The data and rules needed to support functional requirements are typically elicited concurrently.

Non-functional requirement. Describes the environmental conditions or qualities required for the product to be effective. Non-functional requirements are sometimes known as product quality requirements or quality of service requirements. Examples of types of non-functional requirements include reliability, security, performance, safety, level of service, and supportability. Quality of service requirements is not the same as the quality requirements discussed from a project management perspective.

Transition requirement. Describes temporary capabilities, such as data conversion and training requirements, and operational changes needed to transition from the current state to the future state. Once the transition to the future state is complete, the transition requirements are no longer needed.

2.1.2 Evaluation Criteria and process

A criterion is a standard or principle used in the evaluation as the basis for evaluative judgement⁴. Two main principles guide the use of the criteria:

- The criteria should be applied thoughtfully to support high-quality, helpful evaluation.
- The use of the criteria depends on the purpose of the evaluation. They should be covered according to the relevant stakeholders' needs and the evaluation context.

Many sets of evaluation standards and criteria have been developed to support the better use of evaluations.

Evaluation Criteria for Generic use

A well-known set of criteria is the OECD⁵ evaluation criteria. There are six standard criteria that are broadly used for evaluation are following:

- Relevance: The extent to which the objectives of intervention are consistent with recipients' requirements, country needs, global priorities and partners' policies.
- Effectiveness: The extent to which the intervention's objectives were achieved or are expected to be achieved, considering their relative importance.
- Coherence: The compatibility of the intervention with other interventions in a country, sector or institution.
- Efficiency: A measure of how economically resources/inputs (funds, expertise, time, equipment, etc.) are converted into results.
- **Impact:** Positive and negative primary and secondary long-term effects the intervention produces, whether directly or indirectly, intended or unintended.

⁵ Organisation for Economic Co-operation and Development (OECD)



⁴ OECD 2021



 Sustainability: The continuation of benefits from the intervention after major development assistance has ceased. Interventions must be both environmentally and financially sustainable. Where the emphasis is not on external assistance, sustainability can be defined as the ability of key stakeholders to sustain intervention benefits – after the cessation of donor funding – with efforts that use locally available resources.



Figure 6. Categories of evaluation criteria for generic use.

The evaluation process for product development

The PMI-PBA provides accepted good practices to support the practice of business analysis efficiently, effectively, and consistently to deliver solutions that provide the most value. One of the Key Activities is the Solution Evaluation (Figure 4). Within the evaluation key activity, **acceptance criteria** are the conditions that need to be met before a solution is accepted. They are used to measure whether a customer is satisfied with the solution built. Acceptance criteria form the basis of acceptance tests and are essential in evaluating the solution during product review sessions, where **product owners or business stakeholders** decide whether to accept and release the developed solution. Determining the acceptance criteria involves **reviewing requirements** and analysis models with business stakeholders to identify how the business stakeholder would approve something **as done**.

The definition of done might include items such as:

- Acceptance criteria are met;
- Development, test, and defect standards are conformed to; and
- High-level non-functional and usability requirements are met.

Regardless of the level at which they are defined, the acceptance criteria should align with the requirements and other product information because acceptance testing or evaluation of the solution will be based on the acceptance criteria. The definition of **specific evaluation criteria**, such as the **expected or desired range of values for the selected metrics**, is needed within the evaluation process.

It's important to mention that acceptance criteria might be set based on the goals, objectives, key performance indicators, project metrics, customer metrics, sales and marketing metrics, or operational metrics.





2.1.3 Metrics and Indicators

Metrics are qualitative or quantitative measures or inferences used to evaluate the effectiveness of a criterium or a process⁶. Metrics indicate effectiveness, so some prefer the "indicator" instant off "metric". The measures or the inferences are presented with values. There are three main ways to assign the values, qualitative, quantitative and a combination of these two⁷. More specific:

- Quantitative. When measures can be assessed quantitatively, some metrics such as time, cost and revenue can be used as evaluation criteria.
- Qualitative. When the effectiveness is difficult to measure, and there we focus more on inferences.
- A combination. When several aspects of a metric must be assessed quantitatively and qualitatively.

Baseline values

Assessment of baseline values is needed when the metrics compare different stages. In the case of impact assessment, the assessment or definition of the baseline values can be very challenging and requires using various sources, such as proprietary data, records, available literature, statistical data, and expert knowledge.

2.1.4 Dimensions of Impact

Below we describe the three dimensions of Impact (Figure 7) using the Horizon Europe Programme Guide as a source.

- Scientific impact, e.g. contributing to specific scientific advances across and within disciplines, creating new knowledge, reinforcing scientific equipment and instruments, computing systems (i.e. research infrastructures);
- Societal Impact: Impacts on societal benefits, human well-being, fulfilment of human needs, such as an increase in productivity, improvement of working conditions, contribution to human health, improving policies and decision making, and raising consumer awareness. Improving the environmental and climate performance of farmers and your business, with a special focus on environmental sustainability, biodiversity and the European Green Deal objectives

Example: Decreasing soil and water pollution and GHG emissions, Soil Degrade,

• **Economic/Tech Impact:** What economic and technological benefits do the services bring to your business, farmers, and society.



⁶ The PMI Guide to Business Analysis (p. 350). Project Management Institute.

⁷ Maghsoudi, S., Duffield, C. and Wilson, D. (2015), "Innovation Evaluation: Past and Current Models and a Framework for Infrastructure Projects", International Journal of Innovation Science, Vol. 7 No. 4, pp. 281-297



Example: Increasing efficiency, decreasing costs, increasing profits, contributing to standards setting.

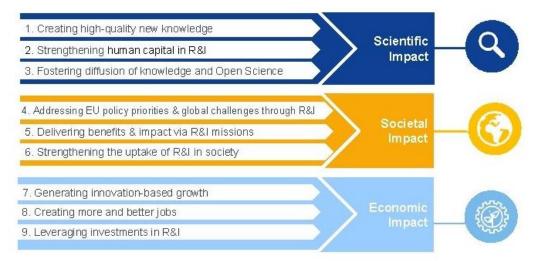


Figure 7. Key impact pathways

2.1.5 Stakeholder and focus groups

During the impact evaluation, it is essential to identify the different stakeholder groups⁸ and assess how they are affected by the Envision products and services. Aiming at stakeholder groups and not generic target groups is a good practice in product development because:

- 1. We consider groups with an indirect or direct interest in the developed solution.
- 2. We organize our work within the key activities to increase the elicitation, analysis and stakeholder engagement activities.

Focus groups bring together prequalified stakeholders and subject matter experts (SMEs) to learn about their **expectations and attitudes** about a proposed solution. Focus groups provide an opportunity to obtain feedback directly from customers and/or end users. The deep dive⁹ from target groups (impact assessment) to stakeholder groups (solution evaluation) and then to focus groups (solution evaluation) within iterations is a good practice in solution evaluation.

2.1.6 Facilitated Workshops

Facilitated workshops use a structured meeting led by a skilled, neutral facilitator and a carefully selected group of stakeholders to collaborate and work toward a stated objective. Facilitated workshops can be used to elicit the information required to develop the product roadmap. Because facilitated workshops support interactivity, collaboration, and improved communications among participants, the technique is a viable elicitation technique for performing this work.



⁸ Or individuals or organisations are directly or indirectly affected

⁹ Informal: a thorough or comprehensive analysis of a subject or issue



2.2 Applied Methodology

To achieve WP5 objectives, **products and services are evaluated** for each business case individually and from three different perspectives related to:

- The performance, usability and effectiveness. We rate the ability of the product and services to cover PAs, and CBs identified needs using co-developed criteria within WP2 describing user requirements (functional and non).
- The business value and acceptance. We evaluate product business value and acceptance for each business case, using criteria codeveloped with the BC actors within the WP5 and indicators that quantify the business value and acceptance.



• The impact on an economic, environmental, and societal level. We evaluate the impact at an economic, environmental, and societal level using impact indicators.

To support the above-mentioned objectives, within T5.3 we identify and tailors a suitable methodology to support the co-development of the evaluation criteria. The methodology needs to formulate standard, accepted, suitable, and representative evaluation criteria for the a) business value and acceptance and b) economic, environmental, and societal impact.

Figure 1 presents the performing steps and working with the BCs actors in physical and virtual workshops, we collect their feedback, analyze the material and inputs, perform a consultation and finally end up with specific evaluation criteria presented in this deliverable.



Figure 8. Activities performed within 5.3

2.2.1 Tailoring elements

The significant elements of our methodology for the definition of the evaluation criteria are the following:

- Use a criteria-based evaluation approach, using best practices described in PMI-PBA guidelines for Business Analysis as a way to support product development.
- For each criterion, one or many indicators may exist.
- Each indicator may take qualitative or quantitative values.
- Use facilitating workshops to support the elicitation process and the co-development of the evaluation criteria and their indicators.
- We emphasize Economic and Societal and not scientific because the Envision project aims at innovation and the Busines Stakeholders are non-research institutes.
- For the impact assessment, the main objectives are the target groups. For solution acceptance, the main objectives are the focus groups.





• The defined target groups are actors related to all Envision services and products. The identified target groups are Farmers, CBs (Certification bodies), PAs (Paying agencies), Policy makers, the General public and Technology Developers/SME.

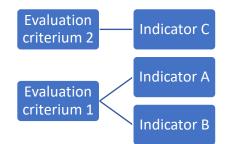


Figure 9 The correlation between the terms "Criteria" and "Indicators". For example, the Evaluation criterium with Code 2 is related to the indicator with code C.

2.2.2 Facilitated workshop design

We have identified and tailored workshop logic and concept that can support the co-development of the evaluation criteria. To design a facilitated workshop, we focus on three essential workshop principles¹⁰:

- First, we act on the principle of "**together**, **alone**" to avoid chaos and inefficiencies and to provide participants with enough time and space to work through a solution.
- Second, **everything is anonymous**. Similar to the "together, alone" principle, this removes any bias that team members might have towards a piece of the solution and allows participants to be more adventurous.
- Third, creativity and expertise are nice, but they are not essential. Our workshop is designed so participants do not need to be creative or an expert in producing creative, interesting results. The workshop effectively replaces those by providing an environment and a step-bystep system that allows people to experiment with ideas while being guided through each step by the workshop facilitator.

There are four major steps (Figure 10) we need to follow:

- Collect: Every workshop needs to start with a phase of information collection. This can be where a team comes together to collect challenges, ideas, data, inspiration, or anything that could come up in an open conversation. The data collected then needs to be visualized for all participants to see. The Collect phase is where the Criteria for an evaluation are defined. The goal of the Collect phase is to collect data from a team and then visualize it in a way that's easy for everyone to understand. This allows everyone on the team to be on the same page before deciding what to work on without any pointless discussion.
- **Create**: Once the evaluation criteria have been collected and everybody's on the same page with the "scope of results", it's time for BC actors to Create indicators. Indicators don't need

¹⁰ Jonathan Courtney "The Workshopper Playbook"





to be final or even well-thought-out – at this point, it's more about creating multiple potential Indicators.

- Link: Once enough content and data have been collected, participants in this part should link the indicators to the target groups.
- **Rate**: For this part, BC actors must choose and rate which indicators are more important than the others for their BC. The goal of a workshop's rate phase is to help a team make choices and rate the indicators with a clear framework and without endless conversation.



Figure 10: The CCLR Framework





3 Facilitation Workshop and its outcomes

To support the elicitation and the co-development of the evaluation criteria, we organized a workshop in Thessaloniki within the Envision project meetings on 5 and 6 May 2022. The participants represented the two major focus groups, the PAs and the CBs, and the Facilitators were P.Ilias and T. Coppens from ILVO. The workshop had five goals:

- Goal 1: Determine the main categories in which the criteria will be placed.
- Goal 2: Define the first set of evaluation criteria and then allocate the criteria among chosen categories.
- Goal 3: Set up goal-related metrics or indicators for each defined criterion.
- Goal 4:Link the established indicators to the target groups.
- Goal 5: Set up numerical weights to determine the relative importance of the indicators for each BC.

The workshop took place in two phases:

- Evaluation Criteria Impact Day One (Section Dimensions of Impact)
- Evaluation Criteria Business value and acceptance criteria (SectionList of Abbreviations The evaluation process for product development)

To set up the workshop all the needed actions were taken, such as inventorying and handling the necessary equipment, checking the list of participants, obtaining information about where the workshop would be held etc. We began our workshop with a presentation that provided the necessary information about the workshop's descriptions, concepts, objections and methodology to ensure a common understanding and clarity of the process.



Photo 1. Explaining to the workshop participants the five goals of the workshop.

3.1 The first part of the workshop: Evaluation criteria

In the first part, we focused on Impact Evaluation Criteria. Below we provide details for each of the CCLR steps:





• **Collect:** We divided the board according to the categories in which the criteria will be placed. We asked all BC actors, without making any distinction between BCs, to write down the impact evaluation criteria on the given sticky notes and stick them under the given categories. Once the given time was up, we performed necessary corrective action as quickly as possible, such as removing the duplicates from the board and reading the collected criteria out loud to the group in order to provide a clear, visual overview of what could be worked out in the next step.

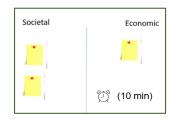
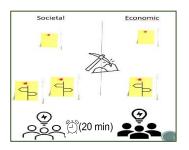




Photo 2. interactive workshops

• **Create:** To work separately on the specified categories, we divided the participants into two groups containing at least one participant from each BC and asked them to create an indicator for each defined criteria. After completing this section, we re-run the corrective actions and gave each group time to review the indicators created by the other group.



• Link: At this stage, we brought together the participants, who were divided into 2 groups, and asked them to link the selected target groups to the indicators they created.

-	<u>PAs</u>	CBs	Tech SMEs
P			
	~	Ê	$\hat{\lambda}$ (5 min)

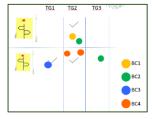
• **Rate:** Then, we gave each BC a strip of 20 voting dots in a different colour and asked them to vote and prioritize the defined indicators for their BC. This allowed us to see which criteria and indicators are important to which BC and how much.



🗇 (5 min)



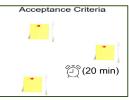
Voting rules: Each BC had 20 votes to use, participants could put as many dots as they liked on one indicator. They can vote on their own or others' ideas.



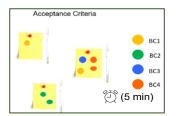
3.2 The second part of the workshop: Business value and acceptance criteria

The second part focused on establishing the business value and acceptance criteria. Below we provide details for each of the CCLR steps:

• **Collect:** To define the business value and acceptance criteria, we once again asked all BC actors, without distinguishing between BCs, to write down their acceptance criteria on the given sticky notes and stick them on the board. Afterwards, we have taken the necessary corrective actions for the needed clarity



• Rate: The focus of this step was to vote on the identified criteria to rate and prioritize them for each BC. Therefore, we provided a colour-coded strip of 20 dots for each BC to vote. Voting rules: Each BC had 20 votes to use; participants could put as many dots as they liked on one criterion. They can vote on their own or others' ideas.



- Wrap up: We have finalized the workshop with a summary of:
 - What has been accomplished?
 - Questions and answers.
 - What needs to be done next?





3.3 Feedback for the Workshop

Collecting feedback for the implementation of the workshops was an essential part of the process. We wanted to collect feedback and comments and use them to improve our skills and systems for the following workshops. Therefore, In this step, we held a small session with all participants after the workshop. To collect open, positive and constructive comments, we use "I Like, I Wish, What If" framework that can help us quickly gather the information we need. This process took place entirely as a mutual conversation.



Photo 3. Collecting feedback

I Like: In this part, we asked about the positive aspect of their experience.

The participants stated that the physical nature of the workshop allowed for better interaction and mobility and that the process was fun. Participants also stated that the information session held prior to the workshop was very useful. Overall, they expressed satisfaction with the result.

I Wish: Focused on constructive feedback, what could have been better, what was missing, and what could be done differently /improved.

In this session, there were only two comments:

- The most striking suggestions were related to the workshop equipment. The participants stressed that replacing the equipment used during the workshop with more environmentally friendly ones (white boards instead of white paper) would be better.
- Another constructive comment concerned the *extension of the workshop duration*.

What If: this was the starting point for questions that are still unanswered and for new ideas.

The most notable comment in this part of the discussion was that *instead of focusing directly on the criteria, the workshop should start from smaller steps such as needs and challenges, solutions and objections and then use these to create criteria.*





4 Analysis of the elicitation results

After the workshop, we digitized workshop results (Figure 11), generating a relational structure that allows performing the analysis in a digital environment considering the tree-based structure of the evaluation criteria and the indicators (Figure 12). Specifically, we created tables of defined evaluation criteria under the categories, and the prioritized indicators for each criterion, with the assigned targeted groups. For this process, we used Microsoft Access to develop a relational structure and to visualise the analysis results of Microsoft Excell (Figure 13).

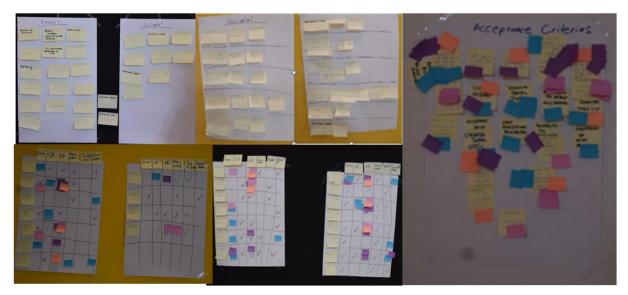


Figure 11 First workshop results in analogue form

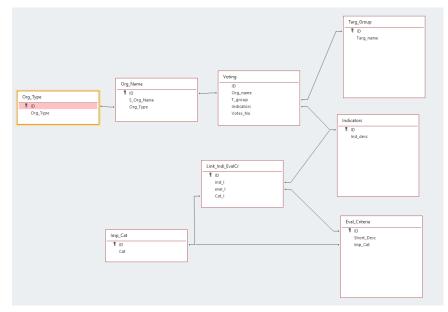


Figure 12 Visualization of the structure and the relations between the database entities.13





5 Consultation phase

After transferring the collected results to the digital environment, we analyzed and organized the resulting dataset and summarized it more conveniently. We processed the results into tables and shared them with Business customers to gather their feedback and comments.

In this way, besides the BC actors we worked with in the workshop, we had the opportunity to collect and integrate the opinions and comments of experts with knowledge and experience on the topic within their organizations. After integrating the collected feedback, we went through it again with BC actors in BC progress meetings for each BC to it. For each BC, we had two meetings, in a total of 10 meetings, to discuss and finalize the evaluation criteria. During these meetings, we had productive discussions and shared understandings of the defined criteria and the method we will use for the evaluation process. As a result of the consultations, some changes were made to the prioritization of indicators and targeted groups, and some new indicators were adjusted.





6 Evaluation criteria

Below we present the list of the co-developed Evaluation Criteria for all BCs, after the consultation phase. More specific:

- Impact Assessment: Evaluation Criteria and indicators.
 - Table 5 Defined Evaluation Criteria related to the Economic/Tech Impact. For each criterium, different indicators have been co-developed. Per each indicator, the affected target groups have been identified by all PAs and CBs.
 - Table 6 Defined Evaluation Criteria related to the Social Impact. For each criterium, different indicators have been co-developed. Per each indicator, the affected target groups have been identified by all PAs and CBs.
- Impact Assessment: Prioritization of the indicators per BC:
 - Table 7 Prioritization of the indicators for the Flemish BC
 - o Table 8 Prioritization of the indicators for the Lithuanian BC
 - Table 9 Prioritization of the indicators for the Cyprus BC
 - \circ ~ Table 10 Prioritization of the indicators for the Serbian BC ~
- Evaluation Criteria Solution Acceptance
 - Table 11. Defined Acceptance Criteria and their votes for each focus group.



Table 5 Defined Evaluation Criteria related to the Economic/Tech Impact. For each criterium, different indicators have been co-developed. Per each indicator, the affected target groups have been identified by all PAs and CBs.

Categories	Evaluation Criteria	Indicators or Metrics	Target Groups						
			Farmers	CBs	PAs	Policy Makers	General Public	Tech Developers/ SME	
	Natural Resource use	Reduced cost of natural resources (water)	\checkmark				\checkmark		
	efficiency	Reduced cost for materials (paper)	\checkmark	\checkmark	\checkmark		\checkmark		
	Improve the objectivity of the inspections/ Transparent administration/Fewer	Decreased mistakes during on-site inspections	~	\checkmark	~	\checkmark	\checkmark		
	mistakes and more reliable info on the declared parcels	Less farmer declaration mistake	\checkmark	\checkmark	\checkmark				
		Less travel cost	\checkmark	\checkmark	\checkmark				
	Cost reduction	Fertilizer use, cost reduction (Chemical use)	\checkmark				\checkmark		
		Pesticide use cost reduction	\checkmark				\checkmark		
		Water cost reduction	\checkmark				\checkmark		
	Decreasing food price	Percentage of food price reduction	\checkmark			\checkmark	\checkmark		
Economic/	Reduce time	Decreased time for monitoring and inspection activities	\checkmark	\checkmark	~				
Tech Impact Criteria		Amount of time saved for administration work	\checkmark	\checkmark	\checkmark	\checkmark			





Categories	Evaluation Criteria	Indicators or Metrics	Target Groups						
			Farmers	CBs	PAs	Policy Makers	General Public	Tech Developers/ SME	
	Stability of results through the years	%max fluctuation of results of markers		\checkmark	\checkmark			\checkmark	
	Energy-saving automation	Less amount of used energy					\checkmark		
	Compliance with	Laws/regulations supporting technology	\checkmark	\checkmark	\checkmark	\checkmark			
	Compliance with regulations	Degree of coherence with a national strategy plan	\checkmark	\checkmark	~	~			
Economic/ Tech Impact Criteria	Ease of use	Number of people who are willing to use the services	\checkmark	\checkmark	~			\checkmark	
	Increasing the farmer's income	Increased Work time use efficiency	\checkmark	\checkmark	\checkmark				
		An increased amount of yield	\checkmark				\checkmark		
	Providing new jobs	Number of new hirings in specific sectors				\checkmark	\checkmark	\checkmark	
	Knowledge sharing	Increased Opportunities for new development					\checkmark	\checkmark	
	Reduce the	Amount of time saved for administration work	\checkmark	\checkmark	\checkmark	\checkmark			
	administrative burden	Number of records farmers shall keep	\checkmark		\checkmark				





Table 6 Defined Evaluation Criteria related to the Social Impact. For each criterium, different indicators have been co-developed. Per each indicator, the affected target groups have been identified by all PAs and CBs.

Categories	Evaluation Criteria	Indicators or Metrics	Target Groups						
			Farmers	CBs	PAs	Policy Makers	General Public	Tech Developers/ SME	
	Natural Resource use	Reduced amount of water	\checkmark				\checkmark		
	efficiency	Reduced use of paper	\checkmark	\checkmark	\checkmark		\checkmark		
	Reduce the administrative	Amount of time saved for administration work	\checkmark	\checkmark	~	\checkmark			
	burden	Number of records farmers shall keep	\checkmark						
Social Impact	Increasing the farmer's income	Increased work time use efficiency	\checkmark	\checkmark	\checkmark				
Criteria		An increased amount of yield	\checkmark				\checkmark		
	Providing new jobs	Number of new hirings in certain sectors				\checkmark	\checkmark	\checkmark	
	Natural Resource use	Reduced amount of water	\checkmark						
	efficiency	Reduced use of paper	\checkmark	\checkmark	\checkmark		\checkmark		
	Food quality	Increased nutritive values	\checkmark			\checkmark	\checkmark		
	Food quality	Reduced amount of pesticide use	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		





Categories	Evaluation Criteria	Indicators or Metrics	Target Groups						
			Farmers	CBs	PAs	Policy Makers	General Public	Tech Developers/ SME	
	Improve the objectivity of the inspections/Transparent administration/Fewer	Decreased mistakes during on-site inspections		\checkmark	~				
	mistakes and more reliable info on the declared parcels	Less farmer declaration mistakes	\checkmark	\checkmark	\checkmark	\checkmark			
		Pesticide use reduction	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
		Decreased % chemical fertilizer	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
Social Impact	Environmental pollution	Better/increased crop rotation practices	\checkmark	\checkmark	~	\checkmark	\checkmark		
Criteria		Increased biodiversity	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark		
		More use of environmentally friendly alternatives	\checkmark	\checkmark	~	~	\checkmark		
		% increase soil carbon contant	\checkmark		~	\checkmark	\checkmark		
	Lower emissions	Decreased number of travelling with motor vehicles for on-site inspection	\checkmark	\checkmark	~		~		
	Provide better insight regarding Carbon stocks in soil to the policymakers, farmers, puplic, sientist	Increased number of use of website, platform		\checkmark	~		~	\checkmark	





	Number of	\checkmark			\checkmark	\checkmark	\checkmark
improve public awareness,	dissemination						
knowledge, and opinion on	activities-publicity						
farming / Consumer Trust	Decreased fraud	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
	possibilities						
	Increased number of		\checkmark	\checkmark	\checkmark		\checkmark
	datasets						
Creation of datasets for	Increased number of		\checkmark	\checkmark	\checkmark		\checkmark
further scientific research	downloads						
	Increased historical		\checkmark	\checkmark	\checkmark		\checkmark
	databases						
	Increased					\checkmark	\checkmark
Knowledge sharing	Opportunities for						
	new development						



Table 7 Prioritization of the indicators for the Flemish BC (max allowed Votes per BC: 20)

Categorie	Evaluation Criteria	Indicators	Target Groups	Votes
Economic/Tech	Reduce time	Amount of time saved for administration work	PAs	3
Impact Criteria	Stability of results through the years	%max fluctuation of results of markers	PAs	3
	Reduce the administrative	Amount of time saved for	Farmers	3
	burden	administration work	Pas	1
	Increasing the farmer's income	An increased amount of yield	Farmers	1
Social Impact Criteria	Improve the objectivity of the inspections/Transparent administration/ more reliable info on the declared parcels	Less farmer declaration mistakes	Farmers	2
	Lower emissions	% increase the soil carbon content	Farmers	2
			PAs	2
	Creation of datasets for	Increased number of datasets	PAs	2
	further scientific research		Policymakers	1

Table 8 Prioritization of the indicators for the Lithuanian BC (max allowed Votes per BC: 20)

Categorie	Evaluation Criteria	Goal related indicators	Target Groups	Votes
	Reduce time	Decreased time for monitoring and inspection activities	PAs	2
Economic/Tech		Amount of time saved for administration work	PAs	3
Impact Criteria	Stability of results through the years	%max fluctuation of results of markers	PAs	2
	Reduce the administrative burden	Number of records farmers shall keep	Farmers	2
	Improve the objectivity of the inspections/Transparent administration/more reliable info on the declared parcels	Less farmer declaration mistakes	ΡΑ	2
Social Impact	Environmental pollution	Pesticide use reduction	PA	1
Criteria		Decreased % chemical fertilizer	PA	2
Chieffe		Better/ increased crop rotation practices	PA	1
	Lower emissions	% increase soil carbon contant	G.puplic	2
	improve public awareness, knowledge, and opinion on farming / Consumer Trust	Decreased fraud possibilities	PAs	3





Categorie	Evaluation Criteria	Goal related indicators	Target Groups	Votes
	Improve the objectivity of the inspections/Transparent administration/more reliable	Decreased mistakes during on-site inspections	Pas	2
	info on the declared parcels	Less farmer declaration mistakes	Pas	3
Economic/Tech Impact Criteria	Reduce time	Amount of time saved for administration work	Farmers	1
	Stability of results through the years	%max fluctuation of results of markers	Pas	2
	Reduce the administrative	Amount of time saved for administration work	Farmers	1
	burden	Number of records farmers shall keep	Farmers	1
	Food quality	Reduced amount of pesticide use	Pas	2
		Pesticide use reduction	Farmers	2
Social Impact Criteria	Environmental pollution	Decreased % chemical fertilizer	Farmers	2
		Better/ increased crop rotation practices	Farmers	2
		Increased biodiversity	Pas	1
	Creation of datasets for further scientific research	Increased historical databases	Pas	1

Table 9 Prioritization of the indicators for the Cyprus BC (max allowed Votes per BC: 20)

Table 10 Prioritization of the indicators for the Serbian BC (max allowed Votes per BC: 20)

Categorie	Evaluation Criteria	Goal related indicators	Target Groups	Votes
	Improve the objectivity of the inspections/Transparent administration/Less mistakes and more reliable info on the declared parcels	Less farmer declaration mistakes	CBs	1
Economic/Tech	Decreasing food price	Percentage of food price reduction	Farmers	1
Impact Criteria	Reduce time	Decreased time for monitoring and inspection activities	CBs	2
	Increasing the farmer's income	An increased amount of yield	Farmers	1
	Reduce the administrative burden	Number of records farmers shall keep	Farmers	1
Social Impact Criteria	Improve the objectivity of the inspections/Transparent administration/Less mistakes and more reliable info on the declared parcels	Less farmer declaration mistakes	Farmers	1
		Pesticide use reduction	Farmers	1
	Environmental pollution	Decreased % chemical fertilizer	Farmers	1
			G.puplic	1





Cate	Categorie Evaluation Criteria Goal related indicators		Target Groups	Votes	
Social Criteria	Impact		Better/ increased crop rotation practices	Farmers	1
		Environmental pollution	Increased biodiversity	Farmers	1
				G.puplic	1
			More use of environmentally	Farmers	1
		friendly alternatives	CBs	1	
		Lower emissions	Decreased number of travelling with motor vehicles for on-site inspection	CBs	2
		improve public awareness,	Policymakers	1	
	knowledge, and opinion on farming / Consumer Trust	Decreased fraud possibilities	G.puplic	1	
		Creation of datasets for further scientific research	Increased historical databases	CBs	1





	Business Case customers			
Acceptance criteria	OCS	LV	CAPO	NPA
Reduce travel time	3			
User friendly	1		1	2
Optimisation of services accuracy, when new data and info are available		1		
Ability to export / download data	1		1	
accuracy of the services with the accuracy required by the regulations		4	4	3
Added value to our existing line of work	1		1	
Reduce time for administrative work	2		1	4
Possibility of integrating services into our existing system		3	4	
Automated exchange of data (no manual upload of shapes etc.)	1	2	2	
Possibility of detecting malpractices ¹¹	1			
Acceptable price	1		3	3
Possibility of crop diversification	1			
Min. Parcel or pixel level results with the good accuracy/ Possibility to recognize small areas	1	1	1	
Useful info for farmers				1
Useful info for policymakers				1
Acceptable service level agreement		1		
Monitoring wide areas	1			
Used by farmers (high % of the user)	1			1
Long-term availability and open data (add on possible for 3rd parties)		4		
Services will be available for at least the duration of the new CAP			2	3
Acceptable speed for bulk or real time operation (upload & download result/ return)	1	4		2
Recognized by the policymakers	4			

Table 11. Defined Acceptance Criteria and their votes per BC (max allowed Votes per BC: 20)

¹¹ an injurious, negligent, or improper practice





7 Conclusions, Risks and Future Steps

7.1 Conclusions

Below we provide the basic conclusions considering the following:

- The effectiveness of the applied methodology and the tools.
- The participation level of the Business Customers (Focus Groups)
- The co-developed evaluation criteria and their indicators.
- The ranking differences come from the Business customers.

More specific:

- The tailored methodology can generate functional outcomes and ensure transparency and standardization of the evaluation process. Additionally, it allows us to move quickly from the macroscale level (impact assessment) to the microscale level (solution acceptance for specific focus groups). The macroscale level deals with expected societal (including environmental), economic and technological impact generated by the results of the Envision project, which are the services and products. The microscale level aims to assess the business value and acceptance of the Envision product and services to specific focus groups, which in our case are the business customers (PAs and CBs).
- The Business Customers are pleased with the applied methodology appreciating the fact they can participate actively and co-developed the evaluation criteria and their indicators. During the different steps of the evaluation process, the participation level was very high (perhaps higher than expected). The facilitation workshop stimulated their interest and created a momentum we need to take into advance within the future steps.
- The co-developed evaluation criteria and their ranked indicators provide a clear direction of
 what is necessary, the expected effect on different target groups and the priorities of the focus
 groups. However, during the monitoring phase, a need for refinement of their structure is
 expected to align better with the standard structure of success metrics or Horizon Europe
 indicators. At the macroscale level (impact assessment), refining the co-developed indicators
 to assess and present the scale and significance will be helpful. At the microscale level, we
 need to enrich the list of indicators with indicators that tackle aspects related to the after-sale
 support, for example, service level agreement (SLA).
- There are differences in the ranking of the indicators related to the evaluation of the impact and the solution acceptance. This does not mean that the Business Customers don't share an agreement on the significance of the indicators because they only have a limited number of votes to use. Its means that they rank in a different way which can support the service providers to design services and products that can cover in parallel existing generic needs and adapt when necessary to their sales policy on specifically identified particularities.

7.2 Risks

Regarding the identified risks and the mitigation measures, those are related to:

• The development of evaluation criteria does not reflect the Business customer's perspective, priorities and needs. As a primary mitigation measure, we engage the business customers in





this evaluation process from the beginning and co-develop the indicators' evaluation criteria and rank them per business case or focus group.

- The development of "hard fill in" indicators. As a primary mitigation measure, we applied an approach that supports co-development, and we followed up with a consultation phase to ensure a shared understanding of the meaning of each criterium and indicator. Additionally, we will define the indicator values using a hybrid approach (quantitative and qualitative values). This way, we will collect values that reflect Business Customer's perspectives without generating an unmanageable administration burden or disability to provide their response.
- **Development of non-functional impact indicators.** As explained above, to deal with this risk, we will refine or enrich the co-developed indicators to maintain their content and logic and have a structure that aligns with HE indicators, providing the scale and significance of the impact.
- **Development of non-functional business value and acceptance.** Similar to the previous but focused on covering all aspects related to the acceptance of solutions by a Business customer.
- Lack of link between impact and target groups or between acceptance and focus groups. We applied a methodology that links the indicators with the target groups (macroscale) and ranks the importance of each indicator per Business customer.

7.3 Future steps

Task 5.3 future steps are the following:

- We are preparing for the feedback collection phase. That means we will:
 - o Identify indicators we need to refine as a way to present impact scale and significance.
 - Enrich the acceptance indicators or refine them to capture missing perspectives or avoid overlaps with the evaluation criteria related to **performance**, usability and effectiveness.
 - Identify if baseline values are needed.
 - Ask the business case customers to provide the baseline values.
 - Define per indicator the type of the values and their range.
 - Develop questionnaires using the co-developed indicators to collect values for the evaluation.
- Start the feedback collection phase.
 - Collect initial indicators in order to have them as a reference point by using surveys, interviews and BC meetings as a tool
 - Monitor BCs progress and collect feedback.
 - Use the information collected and develop the D5.5 Midterm report on the evaluation of services in October 2022.
- Share the feedback with other WPs and especially the service and product providers. Start the second evaluation cycle and compare the results with the previous results
- Develop the final report D5.7 on the evaluation of services by June 2023





End of Document

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