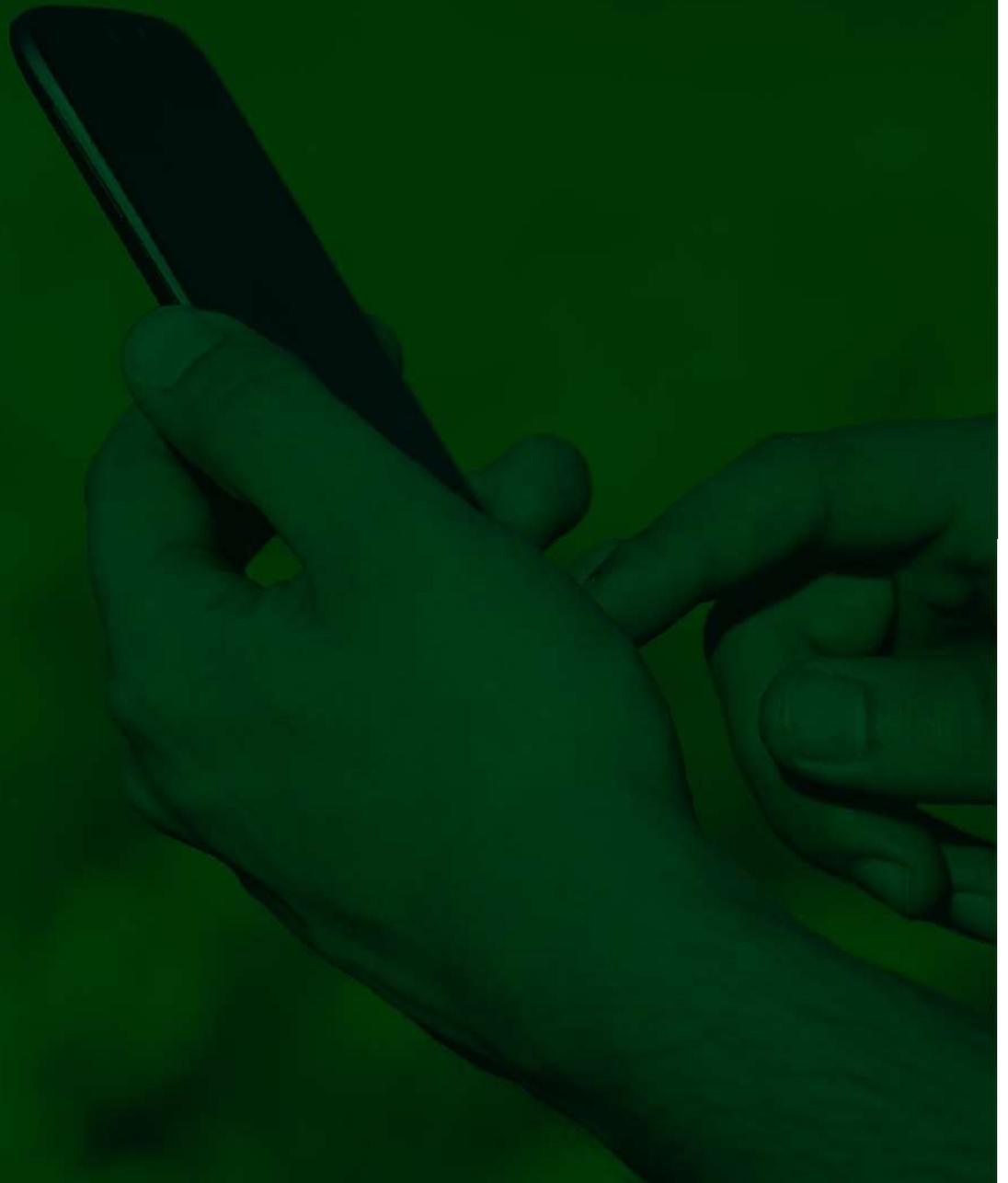




FAIRshare

DIGITAL TOOLS FOR FARM ADVISORS



D4.2 Evaluation of Pilot DATS (30)

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Technical References

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1 Introduction

The overarching aim of FAIRshare is to ensure that farm advisors and their organizations effectively use digital tools and services for supporting a more productive and sustainable agriculture.

WPs 1, 2 and 3 are dedicated to the development of a Permanent Networking Facility (PNF) with pan-European online search and inventory of **Digital Advisory Tools and digital support Services (DATS)**, (WP1), the collection of ‘Good practice’ DATS (WP2) and the in-depth exploration of the ways digital agriculture is advocated and animated in the interface between the advisory and farming communities (WP3).

WPs 4, 5 and 6 will generate and resource a participatory ‘Living Laboratory’, empowering advisor peers from across the EU to interact with the online inventory and, in a series of workshops, to exchange, co-adapt, co-design and apply digital tools. The FAIRshare ‘Living Laboratory’ will enable advisors to address challenges to embedding digital tools in different advisory and farming contexts across the EU.

Work Package 4 (WP4), corresponding to specific objective 1.1.4 of the project, aims to identify the change management and innovation process issues arising from novel or new digital tools and services in different farm advisory contexts through up to 30 **User Cases (UCs)**, identified from partners, third parties and external entities. Digital tools and their novel technologies will be offered from the FAIRshare digital tool platform to UC participants, giving rise to valuable learnings on challenges to embedding DATS in different advisory and farming contexts.

In particular, under Task 4.2, 30 UCs will be identified from partners, third parties, and external entities mainly from across Europe that represent different sectors, production systems, regions and farm advisory contexts. These UCs will be a combination of those chosen in advance through project partners and third parties (20 assigned UCs), and those chosen at a later date via subcontracting. Pilots, observations of DATS adoption, will be set up within these user cases to develop a clear understanding of the issues affecting adoption in different UC context.

In the pilots, the advisors will choose a new approach. They all face challenges in different topics. In the FAIRshare project they identify a challenge they meet and they describe it in a UC. Once they have defined what they want to achieve, they choose or add existing DATS in the FAIRshare inventory (<https://fairshare-pnf.eu/>)

in that context and use them as a key factor in their UC to improve, change or renew their advisory service.

Development will be planned in a Business Case (BC), detailed in an action plan and broadened in a road map and then the implementation will be monitored. Support and training are organised in parallel.

WP4, WP5 and WP6 will provide the support required to facilitate the UC Organizations to eventually optimise their planning, do effective implementation and create maximum learning impact.

2 Methodology

As a first step to accomplish this task, 20 UCs will be described by the relevant project partners and third parties, who will then decide and choose from or add to the inventory, the DATS they find most useful in supporting their farmer clients. The next 10 UCs, will be selected through a public procurement competition (see selection criteria in ANNEX III).

To support the 20 partners in this process, WP4 in collaboration with WP5 and WP6, developed a template for the description of the UCs and BCs, in an attempt to help the UC Organisations to make a comprehensive description of the work they will do to tackle the challenge they face for the benefit of the advisory and farming community. The BC is described in T6.1/D6.1. Based on this description, a BC development will be planned in an action plan and road map.

The templates, merged in one document to simplify the exercise, have been uploaded on the project's share point, together with a document with guidelines and the relevant timeline. Individual files have been created for each UC Organization to save and store their own UC/BC descriptions.

In addition, Naturland, I4Agri and ZLTO provided their completed descriptions for the partners to use as example cases, while describing their own stories.

One-to-one meetings (virtual), regular calls with the partners and communication via emails to answer any questions raised on the template sections, have been engaged by the relevant WPs' Leads and Task Leads, to further facilitate the process.

What is more, an initial review and feedback have been provided over a discussion with all the partners at the general annual meeting which took place on 17th - 19th of November 2020.

During the entire period dedicated to accomplish this task, a dashboard, created and regularly updated by Naturland (T6.1 Lead), has been uploaded on the share point. There, all the partners could see the progress of the whole process towards filling in their own template and have a clear view on what is missing or what is still needed to be further elaborated with their completed template.

Figure 1 below presents the dashboard with the relevant progress on each section of the template provided.

Use Case	TEAGAS/SEAS	IPN1	IPN2	CAFS1	CAFS2	MoA1	MoA2	INAGR	EPC	ZULI	INTA	HAGR	CAJAM	CONS	IDELE	NAK	NATURI	APCA	RCOA	LKO	LAAS
Organisation/ title of the User Case	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Identification of the needs/ challenges advisors face	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Learning history or Future in the context of history	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
General assessment of adoption	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	4	4	4
Factors influencing the current status of DAT in the UC	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Vision	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Action plan for adoption	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Business Case	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Challenge/Problem (SAME)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Target Group	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Budget + external finance (incl FAIRshare budget)	4	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	3	4	4	4	4
Resources	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Approach	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Selecting DATS	4	4	3	4	4	4	4	3	4	4	4	4	4	4	4	3	4	4	4	4	4
Activities	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4
Added Value	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Value Analysis/ How to measure performance	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Risks	4	3	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Cross Visits	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Training, fostering adaption of DATS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Legend

empty	1
1st idea	2
half	3
complete, to be checked	4
checked and ready	5

Figure 1: Dashboard of UC/BC descriptions. Status: 10th of February 2021. Johannes Weiß (Naturland)

From the above-mentioned interactions with the partners, it became clear that the most prominent issues that needed further clarification were on one hand, the definition of the concept and context of the UCs and on the other hand the budget structure and effort allocated in order for them to provide good and realistic examples to work with.

To provide additional support and clarify any open issue, WP4 together with WP6 organized an extra Q&A session (online), on 28th of January 2021, asking partners to submit their questions well in advance. The session this time focused on:

1. Explanation of context of the UC in FAIRshare project, next steps with the UCs

2. Finance of the BC

- Available PMs, personnel costs, and other costs – how to use them
- Extra budget
- Answering all questions, which were provided before
- Further explanation of BC
 - best practice example of Naturland
- Open question Tour de Table for all participants

The slide Presentations of the Q&A's session are presented, in Annex II.

Subsequently, all the 20 UC Organizations filled in the missing points and completed their templates by 3rd of February, according to the new deadline being set and agreed upon in the Q&As session.

3 What is a User Case (UC)

In a UC, a sectoral group of advisors, within an organisation, or a group of independent advisors within a region or a country, describe a challenge they face while delivering better support to farmers to get onto or progress along the digital age.

In the UCs, advisors choose a new approach:

They describe the challenge identified along the digital road and define what they want to achieve: improve, change or renew an advisory service.

Under this perspective, advisors decide and choose/add existing tools to the DATS inventory (<https://fairshare-pnf.eu/>) that they find most appropriate in supporting their farmers clients.

The *core of the UCs*, are the advisors' needs and ambitions for the future.

The *key in the UCs*, is an improved, changed or renewed advisory service.

Learnings from WP2 ('Good Practice' DATS development and use), WP3 (The interface between DA and the advisory and farming communities) will be used to the selection of pilot DATS, while the common understanding of the framework on the living lab approach and change management theories, developed in T 4.1, will further facilitate the practical work in WP5 and WP6.

A significant budget (€90,000) has been allocated to each of the assigned and 10 of the external UCs, which will be used to meet all UCs own costs for staff time (9PM), travel, translations, workshops, hosting cross visits, training and fostering the adoption of DATS.

In the below Figure 2, the main concept of a UC is presented.

What is a User Case?

- ✓ A challenge faced by a group of advisors
- ✓ A new approach with targets of what they want to achieve
- ✓ One or multiple DATS that the advisors have identified to solve their challenge
- ✓ Improved advisory services

Figure 2: What is a UC. Presentation at the Annual FAIRShare meeting on the 17th, 18th and 19th of November 2020

3.1 Explanation of the UC description template

While inviting the partners to select their UCs, we considered that it is crucial to be clear about what is expected from the UCs and in turn what they can expect from the FAIRshare project.

In this context, we have matched the chapters in the UC description with the tasks to be accomplished in the project in regards with planning, implementation and learning process in the pilots, as shown in the following Table 1:

Table 1: UCs' chapters and tasks in FAIRshare

	Task in FAIRshare	Chapter in the UC description
4.2	UC description	Identification of the needs/ challenges advisors face
4.3	Learning from ongoing pilot adoptions of DATS	Learning history or Future in the context of history
4.4	Use of an assessment tool about adoption	General assessment of adoption
5.2	Review environmental factors influencing adoption of DATS	Factors influencing the current status of DATS in the UC
5.3	Strategic vision, approach supporting adoption	Vision
5.4	Action plan	Action plan for adoption
5.5	Roadmap	

6.1	Business cases	Business case (see T6.1/D 6.1) Challenge/Problem Target Group Budget Resources Approach Selecting DATS Activities Added Value Value Analysis/measure performance Risks
6.2	Implementation	
6.3	Cross Visits	Cross Visits
6.4	Training, fostering adaption of DATS	Training, fostering adaption of DATS
6.5	Train trainers	
6.6	Assessment of training and adoption support activities	
7	Communication	

In Figure 3, an outline of the contents of the UC template is provided.

What does the User Case Description Contain

- ✓ A description of the scenario
- ✓ A learning history of the DATS involved
- ✓ Assessment tool of DATS adoption
- ✓ Factors influencing DATS adoption
- ✓ Vision
- ✓ An action plan for adoption of the DATS
- ✓ A roadmap
- ✓ The Business Case
- ✓ Implementation
- ✓ Cross visits
- ✓ Training of DATS use



The pilots will be conducted over a 24-month period, where an interaction between implementation and training (WP6), planning (WP5) and assessment (WP4) will be taking place.

4 User Case descriptions

The following template has been used as a basic format for the description of the 20 UCs.

4.1 Identification of the needs/ challenges advisors face

4.2 Learning history or Future in the context of history

History	Key Lessons learnt

4.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Approval	Use at farms	Approval	remarks

4.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/ negative	impact

4.5 Vision

4.6 Action plan for adoption

Action	Target group	Target	Timing

4.7 Business Case (shown in D6.1)

4.8 Cross Visits

4.9 Training, fostering adaption of DATS

5 Overview and discussion on the 20 UCs

The 20 proposed UCs aim to address challenges in a wide variety of agricultural sectors. Many of the organizations whose UC addresses their own advisors' needs work across multiple sectors as their advisors do. As the pie chart in Figure 5 below shows, a multi sector need was the most common amongst the 20 UCs. Where the UC addresses a need in one sector, the chosen sector is varied: dairy, poultry, citrus, with the most popular being dairy.

The challenges identified in the UCs address a wide range of issues as shown in Figure 4, though there are some common themes. The most popular is the need for knowledge transfer between advisors and farmers, each UC following a different approach. Another frequent theme has to do with improving the handling of data. The topics of remote consulting, record keeping and technology use were also present.



Figure 4: Most common words in the challenge/needs section of the 20 UCs

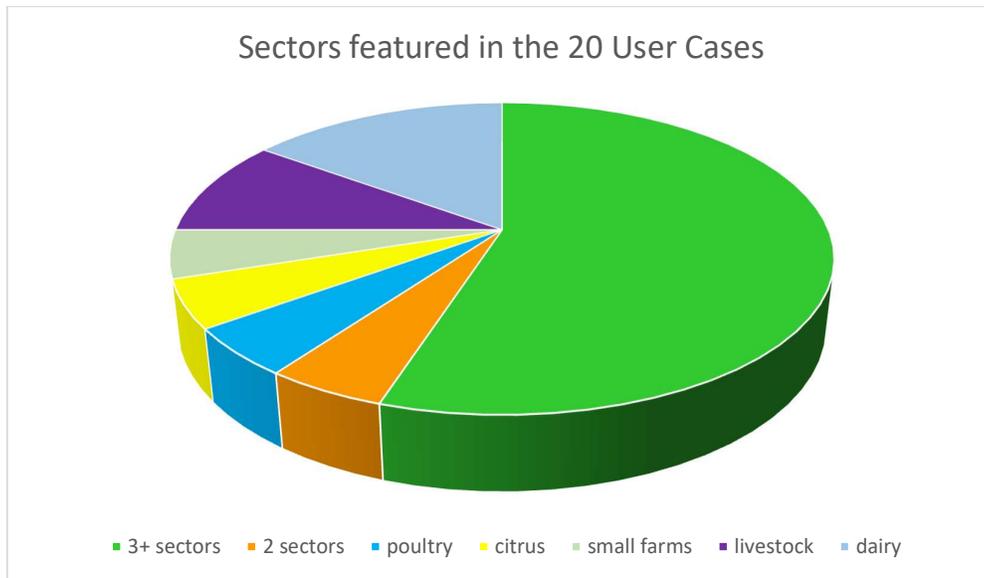


Figure 5 Sectors featured in the 20 UCs

There were some challenges that partners faced in the description of the 20 assigned UCs. Some participants identified a DATS that they would like to work with, before describing a challenge of advisors. In other UCs, it was difficult to detect the advisors' challenges from the description. To address these problems, as mentioned in the methodology chapter of this report, WP4 collaborated successfully with WP6 to guide the partners in how to complete the UC template. Q&A sessions, alongside regular contact by email, have been effectively engaged to facilitate the process. What is more, the progress of the UCs was monitored using a spreadsheet, from which problems could be identified and partners could be supported accordingly (Figure 6). In the end 20 UCs have been successfully completed and can be found in full in Annex I.

5.1 An example of a participant's approach to completing their UC: Teagasc Approach to Internal UC Selection

Teagasc is the state agency providing research, advisory and education in agriculture, horticulture, food and rural development in Ireland. It has a nationwide presence where its c.a. 270 advisors are organised into 12 regional units throughout the county. Teagasc advisors provide extension to 40,000 clients in sectors such as dairy, beef, sheep, tillage and organics. It was decided by the Teagasc FAIRshare team that the internal UC should be selected via an open call to all advisors in the organisation. Therefore, various engagement activities were conducted to promote the call to regional managers as well as advisors.

Applications were submitted to Dr John Hyland using the template provided by D4.2 and D6.1 to collect information pertaining the proposed UC and the Business Case. The deadline for submissions was initially the 18/12/20 but due to unforeseen end of year pressures placed on advisors the deadline was postponed to the 11/01/21. In total six applications for the FAIRshare UC funding were submitted by regional managers. These submissions varied in their focus; hardware, nutrient management, machinery co-operatives, and farm sustainability were some of the main topics covered.

A small Teagasc review team was formulated that comprised of personnel with significant expertise in advisory services as well as ICT tools. The evaluation process deemed that two applications were superior to the others. These two applications were strikingly similar in the challenges they outlined and the manner in which hardware tools such as tablets could be used to overcome them and increase digitalisation. Hence, the two applicants were asked if they would be willing to merge their submissions to which they agreed. In Annex I a detailed overview of the Teagasc UC is presented.

6 Integration with FAIRshare WPs and tasks

WP4, together with WP5 and WP6, are generating and resourcing a participatory ‘Living Laboratory’, empowering advisor peers from across EU to interact with the online inventory (WP1), and, in a series of workshops, to exchange, co-adapt, co-design and apply digital tools (WP6). Within such a framework, the UCs will trial the adoption of some of the digital tools identified as most appropriate solutions to meet the challenges advisors face, based also on information coming from previous tasks in the project (WP2 and WP3).

The learnings from sharing and adoption of these tools will be used in each of the 30 UCs to develop a roadmap leading towards greater use of digitization by advisors and farmers (WP5).

As presented in Figure 7, the individual tasks have been developed in conjunction with each other and begun in a close time frame.

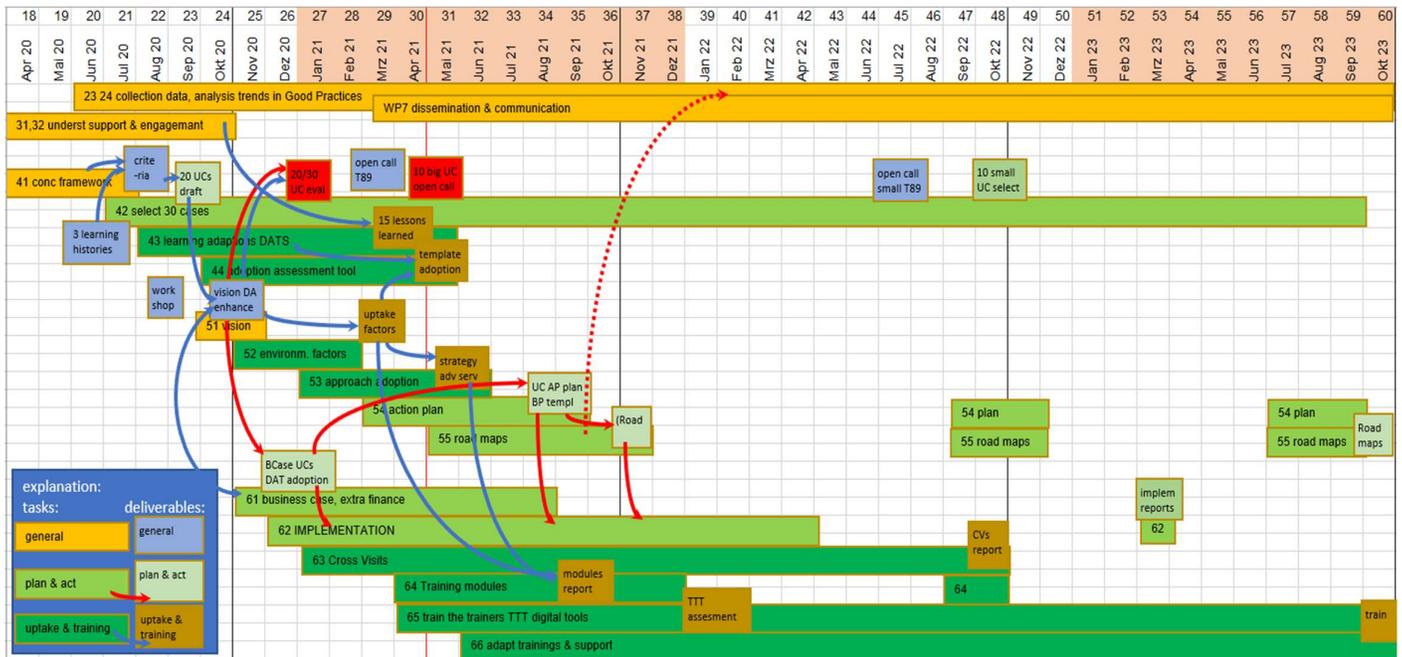


Figure7: Interaction of WP and Tasks in FAIRshare project. Peter Paree (ZLTO)

Working closely together WP4, WP5 and WP6, as planned from the very beginning, proved to be the best practice to get the UC’s started in time and move forward to the next phase of planning and implementation.

7 ANNEX I

Description of 20 UCs

7.1 Teagasc – DICTA (Digital agricultural advice)

Using tablets to optimize the use of digital tools by advisors and farmers and to enhance efficiency, efficacy and frequency of farm visits by agricultural advisors.

1.1 Identification of the needs/ challenges advisors face

In Teagasc, we have a range of decision support tools across all the key areas of knowledge transfer. However, these tools are not currently being used to their full potential by either advisors or farmers. These digital services are largely dependent on, and delivered in, the office and increasingly contact with clients is limited to the office or phone. This mode of service delivery suits staff with good digital skill levels and downplays the importance of the skills and knowledge required for advisory farm visits and discussion groups. This has tended to reduce the number of visits and group meetings conducted and consequently reduced demand from farmers for visits/meetings as they have begun to see Teagasc advisors' workplaces as primarily offices rather than their farms. This changes farmers' expectations and they demand fewer visits as they consider visits/meetings as exceptional rather than a central part of the service. As a result of reducing farm visits some important areas of knowledge such as farm building and infrastructure design, environmental management skills and general knowledge of current local farming conditions can become neglected by advisors.

Teagasc has the obligation to deliver service-based work and also development work. Our unique selling point is our capacity to deliver technical support to farmers in developing profitable, competitive and sustainable systems. The farm visit is key to delivering on this development work. To optimize the value of a farm visit / discussion group, it is important that advisors have access to real time data and advisory materials (large numbers of documents, images, video clips etc. that Teagasc produces) on the farm. They also need access to a toolbox of apps / decision support tools, to complete their work on farm more accurately, more effectively and more efficiently and to be able to demonstrate these app to clients to encourage their uptake.

The main challenges faced by advisors in digital advisory work include:

1. Getting access to real time information while on a farm visits to share with farmers more promptly due mainly to poor connectivity.
2. Getting access to Teagasc systems to demonstrate or use apps.

3. Getting easy access, while on farm, to the large amount of advisory material that Teagasc had built up over years which could be used to illustrate and reinforce advisory messages i.e. documents, drawings, images, videos etc.
4. Inadequate capacity to use apps to complete work on farm e.g. mapping and other resources such as the EPA's WFD app for ASSAP; farm yard design, grazing infrastructure.
5. Visits create work afterwards, which could be completed on farm. Advisors currently don't have the capacity to email directly to a farmer while on the farm.
6. Laptops are suited to office work and not suited for moving around the farm as they are not easily portable and are relatively fragile i.e. not ruggedized.
7. Printing of reports for use on visits - the use of a tablet has the potential to reduce unnecessary and cumbersome paperwork.
8. Limited access to specialist support when on farms. It would be very useful to be able to include a specialist on a conference call where an issue on the farm could be viewed and assistance given in providing advice e.g. crop disease control.
9. If a full day in the field is planned devices running out of charge becomes a problem.

1. 2 Learning history or Future in the context of history

History	Key Lessons learnt
The advisory service is as old as the state and the advisory farm visit created the foundation of this service.	Advisors with a strong on-farm presence are more likely to command greater respect from clients and be more effective as they demonstrate current knowledge, enthusiasm for the work and interest in the client's welfare.
The increasing 'bureaucratization' of advisory work can demotivate and limit advisors horizons.	Advisors need to be out on farms more but are hampered by the office workload and being tied to office-bound digital tools.
COVID has shown that advisors can work efficiently outside the confines of the office and that current connectivity, while limited, is generally adequate to get the job done.	Advisors and farmers are prepared to learn and adapt to new ways of giving and receiving services and can quickly adapt to limited connectivity if necessary.
With the roll-out of high-speed broadband across the country, Ireland is on the verge of	Teagasc advisory services must grasp the opportunity to promote and reinvigorate the

a digital revolution comparable in its potential impact to that of rural electrification	farm visit/discussion group through digitalization.
Individual advisors have used laptops to deliver their work on farm	Problems have been encountered: 1. Patchy network access 2. Portability limitations for laptops 3. Poor access to all clients' apps 4. Poor access to Teagasc network 5. Charging of laptops is difficult

1. 3 General assessment of adoption

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Develop 'Digital Multi-tool' concept	Mar/Dec 2021	10 advisors in each region	Head of Advisory Services	farms	Regional Manager	9month development/test period
Trial of 'digital multi-tool'	Jan/Oct 2022	20 advisors	Head of Advisory Services	1,000 farms	Regional Manager	1 year field trial across region
Pilot roll-out of 'digital multi-tool'	Jan/Oct 2023	20 advisors	Head of Advisory Services	1,500 farms	Regional Manager	Pilot of 'Digital Multi-tool' approach as prelude to national use.

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/ negative	impact
Unsuitable hardware	100%	Negative	Large
ICT Support	30%	Negative	Large
Poor broadband connectivity	40%	Negative	Moderate
Poor Digital Skills / Knowledge	30%	Negative	Moderate
Escaping the office	80%	Positive	Large
Opportunity to use the decision support tools on farm	90%	Positive	Large
Hidden costs e.g., data costs	70%	Negative	Small

1.5 Vision

It is envisaged that the tablets will be purchased and made available to a pilot group of advisors in the two regions. The Project Working Group will conduct a workshop to scope out the potential of the 'Digital Multi-tool approach to improve service delivery. The regions' advisors will then be consulted on how they will use the 'Digital Multi-tool to better deliver their advisory work and a project plan will be adapted based on their input. This plan will include the number of farmers, the number of visits to the farm, the main areas it will be used in, expected productivity gains. The regional manager will then select a number of advisors to participate in the project, based on the quality of individual submissions. Advisors and farmers will be surveyed at the beginning of the project.

All enterprises and programme areas will be represented in the study group of advisors. This is to ensure that the full scope of the technology will be optimized.

It is envisaged that advisors will use this tool to better deliver their advisory work both for one-to-one visits but also for discussion group meetings.

Key areas that the 'Digital Multi-tool' will be used for include:

1. Demonstration purposes for discussion groups on decision support tools and also to facilitate discussion using the white board function on a tablet, using mobile projectors on farm.
2. Delivery of advisory work including grass measuring (Pasturebase), bench marking (eProfit Monitor), mapping for new environmental schemes as well as the ASSAP programme (NMP, my google maps & WFD app), sire advice (ICBF), farm yard planning etc.
3. Showing clients relevant material and delivering selected items electronically to them.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Establish a working group	Advisors, hardware/software experts DATS owners, Specialists,	Develop 'digital multi-tool' specification	Feb/Mar-2021
Refine the Vision	All region's advisors/ some clients, Working Group	Get buy-in, tweak spec.	April-2021
Review and select the relevant DATS	Working group	Suite of essential DATS	May/June-2021
Adapt 'Digital Multi-tool' package	Working Group	Finalize 'Multi-tool' configuration	July-Nov 2021
Trial 'Digital Multi-tool' and monitor/evaluate performance	20 advisors and their clients	Full pilot of the 'Digital Multi-tool' concept	Jan-Oct 2022
Review performance and adapt/refine concept	Working Group	Develop V.2 of the concept	Nov-Dec 2022
Pilot 'Digital Multi-tool' and monitor/evaluate performance	20 advisors and their clients	Test V2	Jan-Oct 2023
Final Evaluation/review/tweaking of performance of 'Digital Multi-tool' approach	Working Group	Develop final 'Multi-tool' version	Sep-Nov 2023
Organise a workshop to present the findings of the project and consider roll-out of the technology across the KT Directorate	Senior managers / regional managers / specialists	Get buy-in from managers for the roll-out of the approach nationally.	Dec 2023

1.7 Business Case (shown in D6.1)

1.8 Cross Visits

AGROasesor is viewed as the DATS most relevant to this project so a visit to meet the team involved that app is proposed. AGROasesor includes a number of DATS that provide professional advice on a number of topics. Some of the DATS within that project would be of interest to us particularly the web-GIS platform but we would also be very interested in how they interface that with farmers at farm level

and what challenges this presents. The platform also provides a field notebook, traceability and administrative reporting which we would be interested in exploring.

1.9 Training, fostering adaption of DATS

Thorough familiarisation the hardware and its capabilities would be essential for all prospective users. The pilot group of 20 advisors would need the equivalent of c.5 days training and familiarisation before using the system in the field so that the clients would get a good first impression of it and advisers would be confident to explore all the potential of the system.

It would also be very important to train all the region's advisors thoroughly in the use of the system when the time came to roll out the system fully across the region. The experience of the pilot group would be invaluable in this regard and they would be the primary trainers. Two days equivalent would be required for each the main body of advisors.

The team involved in the preparation of this proposal includes:

Waterford/Kilkenny

Siobhán Kavanagh (Regional Manager)
Richard O'Brien (Dairy Advisor)
Cathal Somers (ASSAP Adviser)
Nigel Kennington (Dairy Adviser)
Aoife Leader (Walsh Scholar)

Wicklow/Carlow/Wexford

Ger Shortle (Regional Manager)
Bob Sherriff (Drystock POR)
Martin Bourke (Digital Media POR)
Kay O'Connell (Dairy POR)
John Pettit (Tillage POR)
Eamonn Grace (Environment POR)

7.2 IPN 1

IPN – Farm Profitability and Gross Margin Calculation

1.1 Identification of the needs/ challenges advisors face

Agricultural production in Western Balkan and Serbia is mostly organized on small family farms (FFs), which are characterized by poor production results and non-profitability, leading Serbian agriculture to act as undeveloped and non-competitive. Farm Agricultural Advisory and professional Service (FAS/PSSS) are an important link in the agricultural development chain. In Serbia, there is a strong need to strengthen knowledge transfer to agricultural producers, in order to increase profitability on FFs and improve the competitiveness of agriculture.

Within the FAIRshare project, we will look for the possible improvement of the effects of advisory work at FFs (based on private ownership of land and other production assets), as well as the connection between the FFs and the family as a source of labor, through the improvement of the evaluation of the efficiency of the advisory work.

A DATS for calculation of the gross margin (GM) as an instrument for evaluation of FF profitability and analyzing the economic effectiveness of different inputs could improve the results of the advisors' work.

Also, recorded and justified GM improvement at FF might be a tool for assessment of Advisory work.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Long term collaboration of IPN and FAS with FFs, transition from paper reports to digital feed, Advisor access to reports from start	Simple performance indicators are important,
Data collected one /multiple uses	FFs are valuable source of information for themselves but also for wider use.
Different FFs data analysis, advisor and farmer use is too variable	Advisors and farmers need more motivation to use the service
Covid 19 has unleashed the potential for different digital ways of working	Advisors and farmers are prepared to learn and adopt to new ways of giving and receiving services

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Training of trainers / Advisors	4 -2021	5 Advisors	Head of IPN / FS IPN Team	6 farmers	IPN / FS team	
Launch v1	6 -2021	10 advisors	Head of IPN / FS IPN Team	30 farmers	IPN / FS team	
Launch v2	02 - 2022	50	Head of IPN / FS IPN Team	150	IPN / FS team	
Proofing V2	5 -2022	100	Head of IPN / FS IPN Team	300	IPN / FS team	

1.4 Factors influencing the current status of DATS in the UC

Use of DATS by FAS/PSSS has been in its infancy in Southeast Europe. There is a urgent need to expand its use for now. There is a limited impact of FAS to FFs Management and profitability. Therefore, it will be a problem to motivate relevant actors to participate in FAIRshare UC.

Factors	Chance to happen	Positive/ negative	impact
Low Connectivity / cover	20%	negative	Small
Work overload	50%	negative	large
Covid digital leap forward	95%	positive	large

1.5 Vision

User friendly and simple easy to use (laptop/smartphone) advisor farmer interface with a dashboard combining all the major digital services offered to the farmer client. A whole process initiated and lead by Advisors, before FFs adopt it fully.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Establish a working group	Specialists, DATS owners Advisors and Farmers	To Lead the change	2-2021
Training of advisors	FAS advisors	To get involved and tested	March – April - 2021

Implementation of DATS	FAS advisors / farmers	DATS testing and data collection	April – October 2021
Analysis and developing calculations for FFs	All involved	Analysis and improvement	November 2021 – February 2022
Rollout V2	FAS advisors / farmers	Fine tuning of FFs calculations	March – October 2022
Possible improvement of Design and development of calculations for FFs	All		12-2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Cross visits schedule and model will be determined during the implementation period, especially due to Covid 19 situation.

Cross visits will be organized with different stakeholders, preferably with similar Regional actors as a f2f meetings, online meetings or blended (mixed).

1.9 Training, fostering adaption of DATS

Training will be widely delivered through digital tools and supported with (possible limited) face to face interactions, especially due to Covid 19 situation.

Trainings for advisors will take part in most important and critical steps for UC implementation and improvement, focusing on licenced FAS advisors and other enthusiastic consultant workers.

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7.3 IPN 2

ISAA/ DATS FOR IMPROVEMENT OF HEALTH AND WELFARE OF DAIRY COWS IN SOUTH-EAST EUROPE-SEE

1.1 Identification of the needs/ challenges advisors face

Specialists advising dairy farmers need competencies **and tools** to be able to advise dairy farmers on the opportunities and risks of investing in new technologies such as robotization and digitalization of a specific dairy farm.

Herd health on a dairy farm is the **foundation** of profitable milk production. That is why monitoring, prevention and herd health management is a **key process of the overall management of a dairy farm**.

Likewise, the welfare of each individual farm animal is a prerequisite for good health and high productivity of the entire herd.

Advisors need new skills, competencies **and tools** to functionally and systematically analyze and interpret the many data on the health and welfare of a dairy farm that are collected through the application of numerous sensors both in the facility and in / on the animal. DATS could help advisors to exchange knowledge on this subject and inform the farmers better.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
So far, advising and knowledge transfer on dairy farms has focused on improving genetics and nutrition	In the areas of genetic progress of milk production and optimal nutrition, counselors have high competencies and extensive experience
Animal health management, especially cows and calves, on the dairy farm was less in focus. The consequences are the appearance of high levels of lameness and diseases of the hooves of dairy cows, frequent occurrence of inflammation of the udder, uterus and the like. High calf morbidity and mortality rates are also present on many farms. These facts undoubtedly reduce the competitiveness and volume of milk production in Southeast Europe	Effective management of herd health on a dairy farm requires more intensive cooperation between agronomists and veterinarians, i.e. the advisory and veterinary services. This cooperation needs to be institutionalized. Digital health and welfare monitoring will enable effective and more efficient analysis of herd health problems, and successful prevention of disease. In the last few decades there has been a significant decline in the number of dairy cattle in the countries of Southeast Europe, especially Western

	Balkans, therefore they cannot be compared to EU in terms of competitiveness. In Serbia, there is a problem of milking hygiene, as well as reduced milk yield.
The ethical and economic aspects of animal welfare have so far been only partially the subject of milk producer advice. This is very evident when comparing the content of the consultation in the countries of Western Europe and South East Europe - SEASN members	<p>Very common cause of suffering in dairy cows in South East Europe is lameness due to diseases and deformities of the hooves, as well as mastitis. These problems are not effectively enough addressed by advisors, in cooperation with veterinary service</p> <p>The lack of results application in practical conditions also contributes to this situation.</p> <p>Few studies show that high percent of dairy farms in South East Europe have issues with diseases.</p>

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Test-done	May /June 2021	ISAA team and 5 advisors	IPN/ISAA - Serbia	10	IPN/ISAA - Serbia	
Launch version 1	June/July 2021	ISAA team and 5 advisors	IPN/ISAA – Serbia	10	IPN/ISAA - Serbia	
Evaluation of the previous work / Survey of advisors, farmers	September 2021	ISAA team and 5 advisors	IPN/ISAA – Serbia		IPN/ISAA – Serbia	
Launch ver. 2	March 2022	15 advisors	IPN/ISAA – Serbia	15	IPN/ISAA - Serbia	

Proofing and final launch	June 2022	15 advisors	IPN/ISAA – Serbia	15	IPN/ISAA - Serbia	Information and knowledge regarding selected DATS will be shared within the SEASN HUB
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1.4 Factors influencing the current status of DATS in the UC

The topic of digitalization of agriculture has been in its infancy in Southeast Europe. There is little talk about that for now. There is little or no research, implementation and evaluation. Funding is modest. Therefore, it will be a problem to motivate relevant actors to participate in FAIRshare UC.

Factors	Chance to happen	Positive/negative	impact
Young advisors using new ICT technologies	70 %	Positive	Strong/80 %
Young farmers using new ICT technologies	40 %	Positive	Strong/ 70%
Older advisors not using new ICT technologies	85%	Negative	Medium/20%
Older farmers not using new technologies	95%	Negative	Low/15%
Work overload	30%	Negative	Medium/20%

1.5 Vision

- Increasing the impact of digital advisory tools usage in the monitoring of health and welfare of dairy cows in Southeast Europe - SEE
- Learning effects on different levels of advisory services using DATS:
 - TO IMPROVE: Animal health management, especially cows and calves, on the dairy farm was less in focus.
 - TO REDUCE: The consequences are the appearance of high levels of lameness and diseases of the hooves of dairy cows, frequent occurrence of inflammation of the udder, uterus and alike.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Establishing the working group	ISAA team, agriculture specialists, advisors, DATS provider	Initiation of DATS application	February, 2021
Operational planning	ISAA team, agriculture specialists, advisors, DATS provider	Plan of activities	March 2021
Kick off round table within SEASN HUB	ISAA team, SEASN members	Introducing the DATS on a Webinar to advisors and other specialists within SEASN	April 2021
DATS application in local conditions	ISAA team selected advisors, farmers		April 2021
Training of trainers	ISAA team, selected advisors	Theory and practical training on farm (or on line in case of restrictions due to COVID 19)	May, 2021
Training of 15 advisors and application on farm	Advisors, farmers	Theory and practical training on 5 farms (or on line in case of restrictions due to COVID 19)	September/October 2021 till March 2022
Dissemination within SEASN HUB	Advisors, specialists	Dissemination through SEASN conference / bilingual	February 2022
Promotion through public/social media	Advisors, farmers, students	10 articles in agriculture newspapers/magazines	During the whole implementation of the UC/BC

Final Conference of ISAA FAIRshare UC/BC	Advisors, farmers, students, ag. education representatives, ag. policy actors	Members from SEE/ SEASN region	February 2023.
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1.7 Business case (shown in D6.1)

1.8 Cross Visits

Cross-visits are planned to be conducted in 3 different countries (e.g. Germany, Austria and Ireland, but not obligatory). Germany and Austria have experience in adaptation of DATS. Irish advisory service has great advisory service and applies about 40 DATS.

1.9 Training, fostering adaption of DATS

In 2021 training through the usage of selected DAT S in Serbian for 15 advisors from Serbia.

Serbian trainers will conduct training for advisors in other SEASN member countries in 2022 in Serbian and English.

IPN will organize kick-off conference on goals and planned activities of both IPN-FAIRshare UC. Target group will be comprised of advisors from SEASN, veterinarians, farmers, professors, students and pupils of agricultural-educational sector. For promotional purposes, adoption and dissemination of selected DATS in 2021 and 2022 SEASN annual conferences for advisors, veterinarians, agricultural economists, farmers and scientists are planned on the subject of Dairy cow welfare – factor of a better animal health on the farm, greater productivity, economic effect and sustainability of dairy production on family farms in South-east Europe.

In 2021 in agricultural journals, we will publish 5 papers on the key reasons for low level of dairy cow welfare in South-East Europe. On agricultural portals we will publish 10 articles on goals, activities and results FAIRshare /IPN UC.

In 2022 in agricultural journals, we will publish 10 papers on the key reasons for low level of dairy cow welfare in Southeast Europe. On agricultural portals we will publish 30 articles on goals, activities and results FAIRsahe /IPN UC. In 2023 we will organize the closing conference on the results of IPN-FAIRshare UC.

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7.4 CAFS 1

Chamber of Agriculture and Forestry of Slovenia/Digitalization of the conventional Agricultural Advisory Service model

1.1 Identification of the needs/ challenges advisors face

Within CAFS there are 8 agricultural and forestry institutes with a total of 292 advisors, who offer their services to 82.653 farms. The use of various digital tools in advising methods has been a challenge for CAFS for some time. The current model of the Agricultural Advisory Service is largely dependent on on-site visits and limited data availability. The advisory service strives to be more innovative, as well as more responsive and accessible to farmers at any time. This need became even more pronounced during the Covid pandemic. By using different digital tools, combined into a common platform or a standalone digital tool for data collection, data analysis, knowledge transfer and easy communication between farmer and advisor, agricultural advisers would provide farmers with faster and better-quality services, supported by data and information gathered in one place.

Digitalization is becoming our global challenge, as environments with accelerated digitization and thus increased efficiency and accelerated development will be significantly more competitive in the global field. A similar race begins as it was in previous industrial revolutions, with the time available to us being significantly shorter. Optimizing production processes and accelerating the acquisition of new knowledge and practices is a survival challenge if we want to be globally competitive.

Every environment needs a tailored digital transformation program, so it is also necessary to find optimal concepts for agricultural production within global trends. This will improve the adaptability of the Slovenian farmer, facilitate access to specialized markets and production, increase the efficiency of the advisory service, and above all increase the opportunities for the younger generation.

As part of the project, we will introduce excellent communication, consulting and educational methods and tools that will be optimized for the Slovenian environment through the process. This will solve the problem of significantly accelerated knowledge transfer and dramatically more efficient access to counseling services.)

Digitalization affects all pores of business and private life. After the rapid growth of collaborative environments such as Facebook, Twitter, LinkedIn, YouTube in our private lives, more and more opportunities for change in business environments are opening up. Digital transformation, of course, has many dimensions, among them the use of advanced collaborative and educational methods right at the top. Businesses that do not shortly change work processes and provide increased efficiencies through better distribution of distributed groups and effective

education will start to lag behind in a competitive global, regional and local environment. Now is the time to provide space among the leaders.

The field of agriculture is very important for the national economy in the face of all global trends. Increasing the efficiency of agricultural production is a special challenge given the rather fragmented structure of Slovenian farms. In addition to the many development measures that we are implementing and will continue to implement, we must also ensure optimal infrastructure capacity, and a top-notch collaborative educational environment is certainly one of the key opportunities.

Connecting farmers, advisors and other partners in the process of accelerated development of our farms is an important factor in faster progress in all other development segments. The connecting environment is characterized by the fact that it is necessary to develop it on a national basis and thus strongly connect individual agricultural industries into strong cores of knowledge and cooperation.

The main goal of the user case is to improve the efficiency of work in advisory service which will be pursued through effective digitized professional advising, which is achieved by digitizing the work processes of the counseling service and comprehensive remote cooperation using the most advanced communication technologies. Another important goal is to reduce the time spent on administrative requirements to be met by the farm as well as consultants.

It is important to emphasize that the results of the UC will also be useful for small farms, will not be costly and time-consuming for them, but will provide them with quick access to advisors and knowledge bases. It will also enable the digital networking of farmers and advisers from a wider geographical area, thus speeding up the transfer of best practices.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
<p>In Slovenian advisory service doesn't have the connecting digital tools or platform or safety environment for daily work in advisory service. Mostly the advisors communicate with farmers with using telephones, visits on the field, without using existing digital tools for this.</p>	<p>In current situation, when the usage of different digital tools became the everyday needs it is very important to have efficient model for supporting advisor in their work. The daily work of advisors is more and more connected with interventions in CAP. In future CAP the role of advisory service in Slovenia to manage the interventions and fulfilling all administrative requirements became more and more important</p>

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Preparing the flow chart/concept and necessary needs (hardware and software, license, etc) for platform	June 2021	representatives of CAFS and representatives of Ministry of Agriculture (data bases)	CAFS			
E learning	Sept. 2021	3 representatives of CAFS and at least one representative from 8 Agricultural Institutes founded by CAFS	CAFS			
Obtaining acces for use	Sept/Oct2021	Representatives of CAFS and advisors	CAFS			
Trainings of advisors and farmers	March 2022	Representatives of CAFS and advisors	CAFS			

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/negative		impact
Young farmers and advisors using new tools	90%	positive		Large
Older farmers and advisors using new tools	40%	Neutral		small

Data safety and reliability	100%	Positive		Large
Involving new digital methods in training farmers and advisors (f.e. e-learning)	100%	Positive		Large
Stability of platform	80%	positive		neutral
New insights in process relations	60%	positive		positive

1.5 Vision

The vision is to build a system based on the latest world knowledge, practices and technologies in the field of digitalization and training, which is one of the fastest growing segments of information technology, adapted to specific work processes, according to the needs of farmers and advisors. The platform/digital environment will be based on concepts, which include mobile used technologies, which means that it works optimally on the entire range of smartphones and tablets, and on personal computers too. In Slovenia, the development of the 4G mobile network is among the highest in Europe and the highest among rural areas, such as Slovenia, so the necessary conditions for the successful implementation of UC are provided, which was not case a few years ago. The 5G network is also developing intensively.

The vision is also to support different structures of cooperation, counseling and education from individual in the relationship farmer-consultant, farmer-farmer and consultant-consultant, group, where several partners are connected on a regional or professional basis and nationally, such as a single professional community, a single library educational content, a single digital information system, a single online video training channel for focus areas, where the service is provided for all project partners at the state level.

The important thing in this vision is establishing optimal conditions/digital environment for having official prof for different trainings for farmers which are needed in CAP requirements, for giving official certificate for that and also for other trainings (f.e. CECRA certificates – CAFS is accredited regional office for CECRA)

1.6 Action plan for adoption

Action	Target group	Target	Timing
Strategic collaboration with involved partners	management	inclusion	Apr 2021
Set up a plan for elaborating and including digital tools	CAFS team	planning	May 2021
Flow chart for platform	CAFS team and external experts	establishing	Sept 2021
Evaluation of participants	Farmers, advisors	Information and overview	Sept/Oct 2021
Testing and improvement	CAFS team and external experts	Working platform	Dec 2021/Jan 2022
Trainings and dissemination	Farmers, advisors	Skills of farmers and advisors	2022
Cross visits	Advisors, farmers, ICT and other stakeholders	Dissemination	2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Cross visits will be organising inside the Fairshare project. At the moment we don't plan extra crossroads. My plan is to organise Cross visits during the testing phase, trainings and dissemination.

1.9 Training, fostering adaption of DATS

The training courses will be organised in each Agricultural institute for advisors and farmers. Advisors will be involved in training also in testing phase of platforms.

7.5 CAFS 2

Chamber of Agriculture and Forestry of Slovenia/Strategic farm management planning

1.1 Identification of the needs/ challenges advisors face

The European agricultural sector has witnessed many changes in recent decades. The ability to make and implement long-term decisions and the entrepreneurial skills of agricultural producers are becoming key factors of success. Especially for small farms, which represent the majority of farms in Slovenia, the ability to apply entrepreneurial skills is an important aspect of farming and will increasingly be so in the near future. Developments in the market (globalisation, certification, food safety requirements etc.), in agricultural policy (reform of the Common Agricultural Policy of the EU, WTO negotiations etc.) and in society in general (e.g. growing concern for the environment, nature, biodiversity, landscape, animal welfare, natural resources but also the financial crisis that influences market and policy) call for higher levels of entrepreneurship.

One component of entrepreneurship deals with strategic choices. However, farmers focus on day-by-day management and operational, rather than strategic decisions. Therefore, the challenge for farm advisors is to spread an idea of strategic thinking in agriculture and introduce innovative tools to support farmers in entrepreneurship and strategic management process, so that they would be better able to develop strategies and market opportunities. One such tool is ISM+ (Interactive Strategic Management+). One of the key elements of ISM+ is that the farmer develops the strategy himself with the help of advisors through workshops, for the implementation of which a methodology has already been developed within the Erasmus+ project.

The ISM + tool is not yet fully operational because there were some upgrades made, due to which translations into the Slovenian language are missing, and the system for calculating results has also collapsed (results are not accurate, incorrect scales, ...). Once the tool is up and running, an upgrade and connection to digital tools that thematically coincide or complement ISM + (in the context of agricultural economics) is also planned, thus further improving the preparation of business plans for farms.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
The Interactive Strategic Management (ISM) Method was introduced in 3 Central-Eastern EU countries within Leonardo da Vinci Transfer of Innovation ISM Project in 2011-13, to instruct dairy farmers and advisors how to prepare a farm strategy.	The trainings were very positively evaluated. Also, scientifically based positive effects were measured on competencies' development of the farmers.
Based on positive experiences the Erasmus project ISM+ was built (2015-18) due to the need for additional funding for tool development. The target groups of the project were farmers and vocational agricultural students on one hand and agricultural teachers and advisors on the other hand. Slovenia also participated as project partner and quite a few practical examples of use (testing) were made (advisors organized workshops with farmers).	Advisors were enthusiastic about the ISM+ tool and expressed the need to use this tool to advise farmers. The only problem was that the tool did not work well in Slovenian language and it still doesn't.
Due to technical problems with the ISM+ tool, most advisors abandoned the use, with a few exceptions, who, despite the difficulties, successfully conducted a few "pilot" workshops with farmers (2019).	The tool was proven to be attractive to farmers, but needs to be refined to allow credible results.

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
1)Obtaining accesses for use	May 2021	35 advisors	Chamber of Agriculture			
2)Corrections and additional translation of the ISM+ tool and 1-2	November 2021	3 representatives of Chamber of Agriculture and	Chamber of Agriculture			

additional tools into Slovenian language		representative of Biotechnical University				
3) trainings of advisors for the use of the tools	February 2022	At least 32 advisors (4 advisors per advisory service)	Chamber of Agriculture and 8 advisory services			
4) preparation of methodology for conducting trainings/workshops for farmers	March 2022	3 representatives of Chamber of Agriculture and representative of Biotechnical University	Chamber of Agriculture			
5) training of farmers with the existing methodology, which will be adapted to different types of farms	April 2022	At least 32 advisors (4 advisors per advisory service) + 40 farmers	8 advisory services			

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/negative	impact
The desire of consultants for a new way of working in the field of economics	80 %	positive	Large
Willingness of young farmers to participate in workshops from which they directly benefit	60 %	positive	Large
Older advisors find it difficult to tackle the use of new digital tools	50 %	negative	Medium
Overloading advisors with other tasks and lack of time to learn how to use	70 %	negative	Medium

new digital tools or conduct workshops with farmers			
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1.5 Vision

Advisors will conduct training for a bigger number of (mostly young) farmers several times a year in the form of guided workshops based on a well-developed methodology. They will also carry out individual consultations with farmers where the need for such a way of advising becomes apparent. Advising with using the ISM + tool and 1-2 complementary digital tools in the field of economics will bring the following benefits:

- Advisors will be more sovereign in the provision of advisory services if supported by concrete calculations using DATS;
- Young farmers who are just deciding on the direction of production will be able to make more correct decisions and thus establish an economically successful farm faster (a good plan is the basis);
- Farmers who have already specialized in production will be able to adequately upgrade, modify or improve it;
- The use of these tools will contribute to the improvement of the economic situation of farms in Slovenia and the maintenance of agricultural production.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Collaboration with key stakeholders involved in the ISM+ project (WUR) and complementary digital tools	Management	Inclusion	December 2020 - January 2021
Information transfer to all relevant advisors	Advisors	Coordination	February 2021
Regulation of licenses, purchase and accesses	Chamber of Agriculture (+ICT experts); Biotechnical University	Agreement	May 2021
Translations and other adaptations to Slovenian conditions	Chamber of Agriculture and 8 advisory services	Adaptation	November 2021
Information transfer and selection of "test" farmers and "test" advisors	8 Advisory services within	Coordination	December 2021

	Chamber of Agriculture		
Usability testing and analysis	Advisors & farmers	Evaluation	January 2022
Organization of a training program for advisors	Chamber of Agriculture; Biotechnical University	Education	February 2022
First implementation of workshops with farmers	Advisors & farmers	Implementation	April 2022
Cross visits	Advisors, farmers, ICT and other stakeholders	Dissemination	June 2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

A cross visit will be organised to exchange information, knowledge and experience in the field of application of digital tools for on-farm management planning in advisory services with countries that have similar farm and advisory structures. We would prefer the cross visit to be carried out live as soon as conditions allow. However, we are also open for online implementation of the cross-visit.

1.9 Training, fostering adaption of DATS

3-day trainings of advisors will be carried out, both in the context of the use of digital tools for strategic planning, as well as training for conducting workshops with farmers.

For the training CAFS is in charge (in cooperation with Biotechnical University of Slovenia).

7.6 MofA 1

MoA / UC HR01: PhytoView – Pest Monitoring System in horticulture

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1.1 Identification of the needs/ challenges advisors face

During their growth and development, agricultural crops are continuously endangered by the negative effects of harmful organisms, which, by their appearance on a larger scale, can affect the reduction of yields, product quality and can cause great economic damage. The intensity of the occurrence of a harmful organism depends on the climatic conditions, the biological potential of the harmful organism as well as the sensitivity of the host plant.

In order to prevent the deterioration of agricultural crops and yields, it is necessary to implement measures to protect plants from harmful organisms. With the adoption of Directive 2009/128 / EC of the European Parliament and of the Council of 21 October 2009 establishing a Community framework for the sustainable use of pesticides and the adoption of a national Law on the Sustainable Use of Pesticides (OG 14/2014), all Croatian farmers must implement and respect the principles of integrated plant protection. One of the basic principles of integrated plant protection (IPM) is to reduce the use of chemical plant protection products, and the introduction of alternative methods of their control. This Directive applies to all EU members.

Economically significant harmful organisms on agricultural crops are monitored and data are collected through agro-meteorological weather stations, and together with predictive models for pests and diseases occurrence are basic tenet for publishing recommendations on plant treatment in plant pests and diseases control management made by the advisors.

Monitoring of economically important pests and diseases has been carried out by the Croatian Advisory Service since 1997. The main motives for establishing prediction models in plant protection were desire to reduce the number of treatments and in the same time to achieve same or better protection against pests and diseases, which implies less usage of raw materials, lower labour costs, machinery cost and last but not least – significantly reduced contribution to environmental pollution, topic especially actual today. Croatian agricultural advisors, specialists in plant protection using more than 200 agro-meteorological stations with plant pests and diseases prediction models. These agro-meteorological stations are valuable source of current and

historical information about weather conditions and the presence of harmful organisms.

More than 60 advisors of plant protection specialists monitor all harmful organisms on agricultural crops all over the Croatia. They are using pheromone and olfactory traps which are dispersed in orchards, wine yards and olive plantations. For many years, data about pests and diseases occurrence had been collected and recorded by taking notes in a notebook. That practice was acceptable but inevitably slow and tedious. Serious shortcoming of this approach is associated with, is inability to analyse collected data fast and reliable manner while it requires significant human and technical resources to maintain data. Getting actual data in a timely manner as well as getting wider picture is essential in plant pests and diseases monitoring.

Croatian agriculture is characterized by great climatic variety with specific combination of large flat areas with predominant crop production, hilly part with moderate climate, mountain climate with pastures and Adriatic part with blend of Mediterranean agriculture. This climate conditions have a big influence on pests and diseases occurrence in different areas, especially in horticultural sector, fruit, grape and olive. To provide farmers in certain area a good recommendation or advises on plant treatment in plant pests and diseases control management, it is necessary for the advisors to collect, process data, and to develop a reporting system.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
<p>Pheromone and olfactory traps for collecting data on economically important pests and diseases occurrence and correlating data with data from agrometeorological stations is an approach that gives results but requires significant human, technical and organizational effort. While this approach is to some degree satisfactory for advisors it shows significant disadvantages in terms of maintaining data, efficiency and resources' cost.</p>	<p>In order to improve data manageability and facilitate correlation of economically important plant pests and diseases occurrence data with the data collected with agrometeorological stations DATS should be employed. Using the Phytoview application the process of data can be simplified and much more efficient, as well as foundation for data processing, data analysis and data correlation.</p>

While collecting data using, for instance, Phytoview app brings much faster data flow and builds foundation for quality data analysis, if data collection is not controlled, reports could show serious flaws.	To be able to achieve consistent and operational results it is of utmost importance to introduce organisational structure and close monitoring of collected data to ensure consistent data input based on specific regional circumstances (different climates, plant species etc.).
While efficient data collection and consistent input is a foundation stone, if data is not correlated with other data from agrometeorological stations, reports are not adjusted to predictive models and specific needs of the advisors.	To be able to fully take advantage of collected data, correlation with agrometeorological stations should be employed and reporting should be tailored for the advisors' purposes.,

1.3 General assessment of adoption

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Stage 1 done	April 2019	30 advisors - Croatia	Ministry of Agriculture - Croatia	Initially	Ministry of Agriculture - Croatia	Initial version. Plant pests and diseases monitoring.
Stage 2	April 2020	30 advisors - Croatia	Ministry of Agriculture - Croatia	Initially	Ministry of Agriculture - Croatia	Regional standards for data recording defined.
Stage 3 In progress	September 2020	30 advisors - Croatia	Ministry of Agriculture - Croatia	Initially	Ministry of Agriculture - Croatia	Correlation with Agrometeorological stations data.
Stage 4 in progress	March 2021	30 advisors - Croatia	Ministry of Agriculture - Croatia	Initially	Ministry of Agriculture - Croatia	Phenophases included.

1.4 Factors influencing the current status of DATS in the UC

In fruit, grape and olive production, the quality of products and their market value are influenced by the population of pests and plant pathogens. In order for

advisors to successfully transfer new knowledge and technologies to growers, they need new skills and tools that will enable them to better monitor the population of pests and plant pathogens, and a digital tool that will enter observations during the growing season and have feedback over several years.

Advisors need new competencies to be able to advise growers on how to improve production on their farms through the application of new technologies, namely digitization through the application of sensors for measuring air temperature, leaves, soil, and especially the presence of population of harmful organisms and diseases.

Here described DATS, Phytoview mobile application is developed with the purpose of prediction of plant pests and diseases, and preparation of recommendations given by the advisors to the final beneficiaries, the farm, especially fruit, grape and olive growers. This DAT is operational and used by a relatively small group of advisors, specialists in plant protection. Since the most of the recommendations is based on the data collected, the quality of data collection has to be monitored and further improved. Based on the requirements of the advisors, it is necessary to include and to support the usage of this DATS by the greater number of advisors, so the quality of recommendation for fruit, grape and olive growers in correlation with production area could increase.

Further development of this DATS is connected with agrometeorological data and appropriate reports, and the data collection extension to record phenological data.

All the activities planned in this UC is related to increase the quality of data collected in using this DATS by the greater number of advisors, and to transform this information into a set of recommendations useful for advisors, specialists in plant protection and other beneficiaries, farmers, institutes, etc.

In parallel to UC activities, this DATS will be further developed by adopting two new functionalities, correlation with agrometeorological stations data, and plant phenology data. These new functions will be exploit in some extent during the course of the UC activities.

Factors	Chance to happen	Positive/negative	impact
Young advisors using new ICT technologies	20 %	+++ ++	Low/20 %
Older advisors using new ICT technologies	30 %	- -	Medium/30 % Low/15 %
Inconsistency in data collection and reporting anomalies	10%	+	Low/10 %

1.5 Vision

- Increasing the efficiency of plant pest and disease monitoring process
- Recommendation on plant treatment in plant pests and diseases control management in time and of usage for farmers and other beneficiaries
- Learning effects on different levels of advisory services using DATS:
 - TO IMPROVE: efficiency and effectiveness in data collection, data processing, reporting and decision making
 - TO REDUCE: high labour and financial costs

1.6 Action plan for adoption

Action	Target group	Target	Timing
Initial education for advisors on basic functionalities and data collection process	Advisors specialists in plant protection	Making advisors familiar with basic concept and elementary usage	3 months
Daily use of the DATS, experience analysis by power users	Advisors specialists in plant protection	Detecting main issues and shortcomings	6 months
Ensuring consistent data input by normalizing collection criteria on regional and production base	Advisors specialists in plant protection	Consistent data and reports	3 months
Preparing and sharing recommendation on plant treatment	Advisors specialists in plant protection	Tailored recommendations for fruit, grape, and olive growers	10 months
New functionalities, usage of agrometeorological stations data, and phenophase monitoring; advanced education for the power users (trainers training)	Advisors specialists in plant protection and horticulture	Extend functionalities to monitor plant phenophases, and data integration	4 months

1.7 Business case (shown in D6.1)

1.8 Cross Visits

The uncertainty caused by the COVID-19 pandemic will define the plausibility for organizing and participating on Cross visits. There is an interest of the advisors to visit other countries and institutions where fruit, grape and/or olive production is developed, and characterized by using innovation concepts and DATS. In the planning phase, six cross visits for up to four persons are envisaged. Having in mind

the production conditions related to fruit, grape and olive production, best examples can be found in Mediterranean countries like Spain, Portugal or Italy.

1.9 Training, fostering adoption of DATS

In total, eight events like workshops, trainings or seminar are envisaged within this UC. All participants are the advisors-specialists in plant protection and they should be trained in how to adopt and use this DATS more efficiently, but also to exchange and share the information on gaps and missing functionalities. After the implementation of new functionalities of selected DATS financed by additional sources, the advisors from other fields (horticulture) will be included in training sessions. The results of this activities, together with developed and functional DATS will be disseminated to fruit, grape and olive growers across Croatia, by using media channels already appreciated and used by the farmer community.

7.7 MofA 2

MofA / UC HR01: Questions and answers - Farmer's information center - *a system for the collection of information upon the farmers' needs for information*

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1.1 Identification of the needs / challenges that advisors face

Agricultural advisory business is strongly connected to an appropriate communication channels use, relevant, up to date and visible knowledge base suitable to tech age environment, as well as an appropriate distribution of inquiries according to advisor's proficiencies. They are essential for reaching farmers information needs in efficient and effective manner, as well as responding to their inquiries in equally efficient way. Advisors, as well as other officials within the Ministry of Agriculture in Croatia receive lots of inquiries on daily basis and some of them require delicate and topic related specific approach as responses can have noticeable business and financial consequences.

Considering the value of the information upon farmers' needs and inquiries, advisors are getting series of information, knowledge, insights and guidelines, in order to ensure the most appropriate tailor-made approach to advisory activities and professional support to farmers. Questions and answers (Q&A) as a tool and a system provide all kinds of information to farmers, plant production and protection, organic and conventional, livestock, tech and mechanization issues, legal and organizational, as well as technical and professional support, so there

are no doubts upon its importance for farmers. It represents also a valuable source of information upon the farmers that advisors need for their planning and regular works. When considering the structure of knowledge and information support, advisors are directly involved into the system, some of them cooperate with Q&A as a kind of professionals, experts for certain area (horticulture, livestock, plant protection, etc.), while some of them are controllers, specialists of the higher level that control the content and questions, answers and communication.

Once the supervisor/controller approves the answer, the process of answering goes further to the verification expert that approves the answer and finally verifies it. The information flow process is traceable, transparent, ensure opportunity for answer enrichment, control and verification, in order to provide the tailor-made answer and a solution.

Common and traditional channels for accepting farmer's inquiries are telephone, mobile phone and recently e-mail. These channels are considered as reliable with certain advantages. They are highly interactive, require low technical skills and that is the reason they are very popular in farmer's community, especially in older population of farmers, not very familiar with ICT. Main disadvantages of these traditional communication channels are non-structured knowledge base, less suitable for the further analysis, suffering a lack of transparency in inquiry solving, insufficient quality assurance, lack of inquiries quality distribution, challenging analysis, as well as lower distribution of collected knowledge/information, and finally significant human and organisational resources required in order to maintain system efficiency.

The lack of transparency is especially critical in answering inquiries that have substantial financial and business decision making consequences. To overcome identified shortcomings, the employment of DATS is necessary as well as proper organisational adjustments. Q&A as a tool and a system is in the process of integration and network connected to other Ministry applications across the E-counsellor platform that will integrate and improve its impact to the next level, ensuring the most appropriate and the most accurate answers and solutions, as well as digitalization in each aspect. Regular advisors' activities are mostly based on providing the information, data, knowledge and solutions for various farmers' needs, so such a tool or a DATS is the most appropriate support for advisor, tailor made for advisors and farmers.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Usage of traditional communication means in response to farmer's inquiries, employed for a long time, is appropriate for the most of farmers' population, particularly the older generations, used to direct communication. While this approach is to some degree satisfactory for farmers, it shows significant disadvantages for advisors handling inquiries in terms of efficiency and resources' cost.	In order to improve farmer's inquiries response quality, transparency and relevancy, advisors find critically important to implement the ICT and the new and innovative solutions, so to provide and improve overall efficiency.
Traditional farmer's inquiries response lacks: <ul style="list-style-type: none"> • structured knowledge base, • means for quick analysis, • transparency and requires excessive resources to maintain transparency and verifiability.	ICT system should be employed to alleviate observed disadvantages to traditional handling of farmers' inquiries to be able to obtain: <ul style="list-style-type: none"> - Structured inquiries and knowledge base - Distribution of inquiries to competent specialist groups, - Response quality assurance - Transparent correspondence - Quality knowledge base - Appropriate response time - Distribution of acquired knowledge base by appropriate channels.

In order to ensure the most effective and efficient *information collection system important for the farmers on general or specific topics*, as well as to provide transparency, relevancy, and communication clarity, advisors need an appropriate communication system, covering all the topics related to agriculture, as well as the set of supporting information, knowledge, and institutional support. Accordingly, that resulted in the Q&A, digitally enhanced system for mutual information sharing and quality communication in agriculture.

1.3 General assessment of adoption

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	Remarks
Stage 1 realized	January 2020	40 advisors	Ministry of Agriculture	All types of agricultural	Ministry of Agriculture	Initial version. Only

		- Croatia	(MoA) – Croatia	production (plant, livestock, organic, etc.)	(MoA) – Croatia	advisors included.
Stage 2 ongoing	March 2021	200 advisors and officials - Croatia	MoA - Croatia	All types of agricultural production (plant, livestock, organic, etc.)	MoA – Croatia	Second version. MoA officials and advisors included, integration with official web sites, AAI framework incorporated. Improved question delegation and handling.
Stage 3	March 2022	Power users	MoA/Croatia			Trainers network development
Stage 4	June 2022	200 advisors and officials - Croatia	Ministry of Agriculture - Croatia	Initially	Ministry of Agriculture - Croatia	Information and knowledge base further development and integration, opening the space for the new research and advisory activities.

1.4 Factors influencing the current status of DATS in the UC

“Questions and Answers” (Q&A) as a DATS is in the production phase, but also actual advisors’ Q&A experiences lead to conclusion that there is a potential for multiple benefits from information provided upon Q&A use, as well as potential for the learning through receiving valuable information out of Q&A, in order to ensure the most suitable solutions for the farmers’ businesses, based on the

questions and answers relation and suitability. Such a development will be continued and provide through the selection of the high impact topics, questions, answers, resulting in solutions for the certain challenges, either in agricultural production, business processes, communication, integration, relation or just an institutional support and developing the reliable DATS for various agricultural business needs. After consultation with experts working on Q&A, either specialists, control or verification ones, their reports on topics, frequently asked questions and data provided, advisors may focus their attention, get new insights upon the new needs or experiences, so this ensures a kind of knowledge base or enrichment of existing ones.

In order to ensure the DATS implementation, advisors will be equipped with the Q&A knowledge base, specialist knowledge, relevant information and answers base, so to provide the most convenient approach, the most appropriate solution to farmers' challenges in everyday business.

Q&A reports, short guidelines or directives, as well as relevant statistical data and knowledge base excerpts are highly relevant and expected for the further publications, either through the official media (Government, MofA, other institutions) and bulletins, as well as social media, professional and scientific publications, so to provide the information to farmers, as well as to advisors.

Q&A is expected to provide the necessary and practical information support, knowledge source and guideline to farmers, but also to connect the network of advisors' knowledge bases, integrate and multiply knowledge, improve the communication, as well as knowledge utilization.

The key advantage of this DATS is in the continuous collection of questions, inquiries, comments, initiatives etc., providing answers, and through exploring this communication processes, providing new topics and research areas, as well as improving existing ones.

Q&A represent the valuable and a high-quality source of information, insights and relevant data upon the farmer's challenges, knowledge and information needs so, in order to bring the most accurate and the most appropriate answer and a kind of solution for the challenges mentioned.

Factors	Chance to happen	Positive/negative	impact
Young advisors using the new ICT technologies	75 %	+++	Strong / 80 %
Young farmers using new ICT technologies	45 %	++	Strong / 70 %
Older advisors using the new technologies and ICT	25 %	- -	Medium/20 %
Older farmers and using new technologies	10 %	-	Low/15 %

1.5 Vision

- Increasing the impact of DATS usage in the field of handling farmer’s inquiries
- Providing necessary information and solution for farmers’ challenges
- Learning effects on different levels of advisory services using DATS:
 - TO IMPROVE: efficiency and effectiveness in providing satisfactory solutions to farmer’s inquiries
 - TO REDUCE: high resource costs

1.6 Action plan for adoption

Action	Target group	Target	Timing
Initial (basic) education of advisors Advanced education (“trainers’ training”) for the power users	Advisors	Making advisors familiar with basic concept and elementary usage	3 months
Daily use of the system Experience analysis by power users, Q&A will be based on the set of key activities (preparation, processing, analysis and dissemination of information generated by the application) in order to improve the advisory work	Advisors	Detecting main issues and shortcomings	8 months
Improving system visibility through integration of acquired knowledge base with official web sites, introducing Single Sign-On mechanism for better handling user authorization and authentication, improving task flow for efficient inquiry handling.	Advisors and farmers	Adding others functionality, improving overall visibility and usability.	7 months
New knowledge base establishment, as a solution development base.	Advisors, farmers and ICT experts	Build the network and a centre of knowledge	4 months
Q&A reports, short guidelines or directives, as well as relevant statistical data and knowledge base excerpts are highly relevant and expected for the further publications, either through the official media (Government,	Advisors and ICT experts	Build the network and a centre of knowledge and development	2 months

MofA, other institutions) and bulletins, as well as social media, professional and scientific publications, so to provide the information to farmers, as well as to advisors.			
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1.7 Business case (shown in D6.1)

1.8 Cross Visits

Considering the slow progress of COVID-19 pandemic risk solution and its impact for the logistics, traffic and other important fact related to project activities, Croatian team is ready for the various situation development. Whether possible, our advisors and ICT experts considered countries with a high level of ICT development, implementation, and adoption, high level of farmers education (higher than the one in Croatia) and advisory knowledge support, providing advisory service, knowledge transfer and information support communication habits developed, so to explore the potentials for such a DATS utilization.

In the planning phase, our team planned 6 cross visits for up to 5 persons. Aiming for the higher level of ICT and agricultural knowledge and development, related to all kinds of agricultural production, Croatian team expect the highest levels and the most developed environment in the Netherlands, Ireland, Norway, Sweden, Denmark, Germany and Austria.

1.9 Training, fostering adoption of DATS

In total, 9 events like workshops, trainings or seminar are planned throughout this UC. The participants are advisors and ICT specialists, so they need training for the development and further knowledge transmission, how to utilize and adopt the DATS more efficiently among farmers, but also to exchange and share the information on gaps and missing functionalities.

After the new development or new functionalities implementation, financed through the national budget resources advisors and ICT experts will be enrolled to the new training sessions. That will result in the new set of activities, improvement and development of advisors' knowledge and skills- Accordingly, Croatian team will significantly improve their capacities, develop, enrich advisory services range and scope, so farmers, as end users will benefit in multiple ways.

7.8 Inagro

INAGRO helps advisers tackling ration challenges on dairy farms

1.1 Identification of the needs/ challenges advisers face

Inagro farm advisers face challenges in improving their service towards dairy farmers on ration. They developed an excel file for that purpose, with some limitations and room for improvement.

Nowadays advisers have the challenge of exchanging about ration practices without the ability of face-to-face meetings and on farm consultation.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Pre DATS history: It all started with a simple calculation form of the ration, almost 25 years ago.	This calculation is just the basis and thus the start for ensuring an optimal running dairy cattle farm.
In the last decade there was an enlargement of the dairy sector leading to less, but larger dairy farms and a growing demand and complexity for dairy farm advice.	These expansion urges for another approach on ration advice and thus a more sophisticated ration DAT
External (of ration DATS) data on eg animal performance data (different sources) are evaluated for the optimisation of the management of the advised farms	Need of DATS with more options & dashboard to support e.g. the PDCA cycle of the feed management and ensuring results on farms in Flanders.
Some (most of the time remote) advice messages are disregarded/ not been followed up by advised farmers	Need for output automatic alerts messages to farmers and follow up actions
We found that collection of more (integrated) data leads to more accurate advice, thus better farm (ration) management results.	-farmers would benefit from possibility to pass data to their advisers. For e.g., through a smart-phone application . - sensor and other automatic generated data would also help to collect data on feeding management on farms.

-limited support of IT-department to develop and update ration DATS	Due to the limited resources of IT-technical support, the development of the DATS must be able to be done in the first place by the advisers themselves.
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1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Approval	Use at farms	Approval	remarks
Test done	June 2021	2	6/10	5	6/10	
Second test	December 2021	4	8/10	100	8/10	

1.4 Factors influencing the current status of DATS in the UC

The success of the DAT will be influenced by the ease of use by the advisers, ease of exchange of advice with their farmer clients. This will be affected by (preliminary results):

- How comfortable farm advisers are with using the ration DATS
- How much data farmers will collect and pass to the advisers
- How comfortable farmers are in using the dashboard

Factors	Chance to happen	Positive/ negative	impact
Input of data by farmers	80%	+	60%
Full option use of DATS by advisers	80%	+	100%
Advisors advice is more efficient, farm results are more robust	100%	+	60%

1.5 Vision

Farm advisors are struggling to give ration pertinent advice to farmers and ensure results on their feed management and animal performance. Farm advisors may wish to use this DATS to increase their ability to exchange ration advice remotely with their farmers. The DATS is interactive and allows for communication & exchange between the farmer and their advisor. The knowledge exchange can be aired at a set time, or pre-recorded with the ability to playback, allowing farmers to access the information at a convenient time for them. This should increase farmer willingness and ease to use the DATS. Action plan for adoption.

Starting from the learning history, we will identify and enhance the most useful and feasible needs for the ration DATS.

1.6 Action Plan for Adoption

Action	Target group	Target	Timing
Collaboration with farm advisors, experts on dairy farm feeding	Dairy farm advisors	Agreement	Jan 2021
Operational planning	Dairy farm advisors	Action plan	Feb 2021
First test	Selection of farmers	5 farms advices tested	March 2020
Evaluation and adaptations in practice	Dairy farm advisors	Evaluation meeting	April 2021
Second test	Selection of farmers	15 farms advices tested	May 2020
Evaluation and adaption of the DATS	ICT, farm advisors	Adapted DATS	August 2020

1.7 Business case (shown in D6.1)

1.8 Cross Visits

The cross visits might be virtual depending on the restrictions in place due to the Corona crisis. The Netherlands works with the same feed evaluation system as in Flanders, Belgium and is the region we look to for exchange on our DAT.

1.9 Training, fostering adaption of DATS

The training will be supported by the use of webinars.

Feedback from training will be gathered online. Ilse Louwagie from Inagro will lead the training sessions on the DATS.

7.9 EPC

EPC; Overcoming the challenge of farm sensor data interpretation for the optimization of poultry production

1.1 Identification of the needs/ challenges advisors face

Poultry production has intensified significantly in the last 50 years. This was only possible due to increased automation and control of the production process. Nowadays, climate, feed, and lighting controls are indispensable in a poultry farm. In these controls, sensors are used to measure key variables such as temperature, humidity, feed use, water use, light levels, bird weight etc. Together with human observations regarding animal health and welfare status in the poultry house, the farmer and advisors continuously evaluate the trends in these data in order to optimize the production process. To track the quick changes in a poultry flock, farmers are visited by advisors on a bi-weekly (broilers) or monthly basis (layer hens).

Whereas a farm house visit will only give a snapshot impression of the situation in the poultry house, sensor data collection is continuous. Hence these data contain a lot of information for the farmer and an advisor. The challenge however lies in the correct interpretation of these data. Therefore, Digital Advisory Tools (DATS) are needed to transform these data into valuable information for the farmer and the advisor to optimize the poultry production process.

Existing DATS focus on the collection of farm data, and take it one step further in the interpretation of these data. As a result, the end user can perform different kind of actions:

- Descriptive actions, such as benchmarking of flocks
- Prescriptive actions, such as taking preventive measures
- Predictive actions, such as predicting end weights or slaughter dates, hence optimizing production.

The transformation of data into key production indices and simple graphical visualizations allows the advisors to better understand the data, and hence the ongoing production process. This better understanding will result in an improved advice towards his customers.

Further data analysis can also identify hidden relations between production and welfare parameters. Once this relation is known, and the impact can be estimated, the advisor can inform the poultry farmer on what to change to overcome a current issue, or optimize production in general.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Poultry farm data was mainly acquired by manual input of mortality, feed consumption and water intake. Standard charts were used to collect these data. Manual inputs are more error-prone than automated logging.	Sensor techniques and farm automation allowed the automated logging of important flock data. Only mortality data is still entered manually
Poultry farms rely more and more on sensor data and farm automation. Farm automation accuracy depends on sensor calibration and control settings. Too often, system settings are not changed or fine-tuned after installation.	Sensors need more frequent calibration, and control settings need to be updated frequently to allow optimal production results.
Advice is based on general knowledge of what works in most other farms. However, there are multiple factors affecting farm efficiency.	The average flock does not exist, so an individual approach to each flock is needed to obtain optimal results.
During an advisory consult, the advisor will visit the farm and inspect the birds in the flock to evaluate current flock status. This evaluation is subjective in its nature as it depends on the individual advisor's approach.	A flock visit will only give a snapshot impression of what is happening in the poultry house, so continuous logging of events and data will objectively describe the status.
No advisor can exactly predict the future. Future predictions are based on the experience and knowledge of the advisor. Therefore, experienced advisors are more valuable than young starters in the job.	A data-based decision support system will assist young potentials in delivering good advice, and support the training of young farmers and advisors in their roles.
Advice is based on numbers, findings and interpretations of the advisor. Feedback is usually supported by documents with predefined tables and graphs.	An interactive tool with dynamic plotting and table generation will enhance the discussion between advisor and farmer.
The interpretation of the abundance of farm data is limited to the analytical skills of the advisor and farmer.	A data-based decision tool has more analytical skills than a person. Recent developments in artificial intelligence and machine learning only increase the analytical power of these data-based decision tools.
In order to get an overview of all farm data coming from the different kinds of process computers such as climate controls, feed controls and bird weight stations, a custom-	Huge file sizes lead to long processing times, and a macro script is prone to errors.

made macro-enabled Microsoft Excel file was developed to gather all data and make appropriate data visualisations with only one click of a button.	
Correct definition of data variables is key to the interpretation of data	Data needs to be standardised to allow farm or flock comparisons
The benchmarking of data over time allows the comparison of different flocks to evaluate the production, health and welfare performance in the farm.	Tools and farm data are needed for making the correct benchmark analysis
The adoption of software solutions and digitalization of the poultry sector is slowly progressing. Young start-up companies fill in the void that exists between farmers and tech providers.	Integrated software solutions that facilitate poultry management are gaining ground in the poultry sector.

1.3 General assessment of adoption

Porphyrion^[1] is an IT provider that enables big data analytics in the poultry sector. It has more than 10 years of experience in the sector. By combining new automation and ICT techniques, animal science, biostatistics and the experience of involved people, the complete production process can be optimized. Real-time monitoring of a flock, by raising early warnings for quick interventions, improves production efficiency and sustainability.

PeHeStat^[2] collects health parameters, house parameters and laboratory results from the industrial poultry sector for performance and health statistics. Thorough analysis will give individual advice to the poultry farmers. The portal provides an administrative simplification for poultry veterinarians, and the direct link with the farm management software is also a simplification for the farmers.

The adoption of the Porphyrion and PeHeStat tools will be planned according to the following timeline with set milestones.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Agreed changes in PeHeStat DATS	Feb 2021	3	2/3	1	1/1	
1 st validated DATS	Oct 2021	5	3/5	1	1/1	
Commercial evaluation	Apr 2021	10	7/10	5	3/5	

1.4 Factors influencing the current status of DATS in the UC

The strength of the DATS is dependent on the available sensor data in the farm. The inclusion of more sensor data will result in the generation of more KPIs, and hence a better insight in what is going on in the farm.

Another issue is the ownership of data. In general, farmers are the owner of the data generated on their farm(s). They can decide who will get access to their data. Therefore, the farmers should be open to share data with third parties.

Data alone will not run the farm. Interpretation of these data is key. Farmers and advisors already have the skills to make a correct data interpretation, albeit in a much lower level. The challenge here is the magnitude of the big data in front of them. It will require some analytical skills of the advisors to overcome the interpretation of data, but it can result in new insights that he was not aware of before.

Factors	Chance to happen	Positive/negative	impact
Porphyrio® and PeHeStat are leading software solution providers, willing to improve their tools. This will facilitate the adaption of the tool	75%	Positive	++
The selection of PeHeStat will exclude poultry farms that choose other software solutions	20%	Negative	--
Automatic data collection needs to be reliable (“garbage IN = garbage OUT”)	20%	Negative	--
The cloud-based software solution requires a stable farm network	60%	Negative	-
Poultry farmers need to be open to share data to third parties	60%	Negative	-
The new method of big data analytics might reveal new insights in poultry production processes	50%	Positive	++
Farmers and advisors need to have or learn an analytical mind-set to use DATS.	50%	Positive	+

1.5 Vision

The automation of farm processes has revolutionized the poultry industry. Farms grew bigger, whereas the labour did not increase. This resulted in increased production results through process control and early warnings. Recently more

constraining factors are involved, mainly concerning animal welfare and sustainability. Therefore, in order to reach optimal poultry production, performance, welfare and sustainability need to go hand in hand. This can only be done in a fully controlled process.

Farm control generates big data, which can be overwhelming in the interpretation. Tools need to be developed to assist the end-users in the interpretation of these data. Interpretation can only be done when the data are correctly presented, and KPIs are calculated.

The development of data interpretation tools will encourage poultry farmers to invest in the sensor technology. This will allow advisors to get a better understanding of the farm, and help them in making data-driven decision-making. Standardized data collection will allow the benchmarking of individual farms, or even flocks, against other farms and flocks. This will allow the evaluation of management practices for optimal production results. This goes for the farmer, as well as for the advisor: feed advisors can evaluate the effect of different feed or feed additives on multiple farms; veterinary advisors can evaluate treatment and recovery in multiple flocks; hatchery advisors can evaluate parent stock performances and hatchery practices...

Through the combination of data interpretation and advice services, market benchmarks can evolve into organizational benchmarks, specifying ideal performance curves for genetic poultry lines, feed stuffs, housing systems etc.

1.6 Action plan for adoption

The adoption of the tool will happen in different stages.

1. Information will be gathered to develop the new DATS tool. Data input sources will be defined, Porphyrio® and PeHeStat platforms will be configured and the specifications of the DATS will be set (for instance health KPI).
2. The first version will be developed by the IT platform provider according to the set specifications.
3. The first version will be validated in the poultry farm at EPC. The many small flocks will provide the variation in data necessary for statistical analysis. Feedback from local advisors will be used to optimize the first version of the tool.
4. Advisor feedback will be implemented to optimize the tool. After these modifications, the tool will be deployed at 5 commercial poultry farms.
5. Commercial farmers and advisors will be trained to use the new DATS tool.
6. To evaluate the DATS tool, feedback from commercial farm advisors will be collected after several months in use.
7. Final dissemination of the DATS tool will take place at the end of the adoption period.

Action	Target group	Target	Timing
RESEARCH	DATS provider, advisors	-defined platform configuration -data sources	Feb 2021
DEVELOPMENT	DATS provider	-dashboard -health KPI	Jun 2021
VALIDATION	EPC, advisors	DATS validated by EPC	Dec 2021
DEPLOYMENT	Farmers, advisors	DATS deployment at commercial farms	Feb 2022
EVALUATION	Farmers, advisors	Report DATS feedback from users	Oct 2022
DISSEMINATION	Advisors, farmers	Dissemination activities on national level	Dec 2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Three types of cross visits will be organized:

- Cross visits will be made to other intensive livestock sectors to evaluate the possibility of the translation of the dashboard to other species and/or production methods
- Cross visits will be made to other poultry regions in EU with different market orientations. In Flanders, poultry farmers are entrepreneurs, whereas in other countries the poultry sector is more integrated.
- Cross visits will be made to study similar DATS and dashboard to identify common practices for the identification of a general roadmap.

1.9 Training, fostering adaption of DATS

Training sessions and dissemination events will be organised (farmers and advisors) to develop skills, gather market feedback for tool improvement, action points for workshops, with the necessary translations and adaptations.

Face to face training sessions is preferred, but Online training sessions will be developed if COVID-19 restrictions persist.

7.10 ZLTO

ZLTO - Use Case Data Driven Decisions, join efforts for a better dataset and decision support

1.1 Identification of the needs/challenges advisors face

ZLTO dairy farm advisors face the challenge to make a real improvement of farm results. So, they developed a relevant dataset with clear presentation, techniques to select the key performance indicators and analysis to improve the performance. Lessons learned from that are summarised in 1.2.

Many relevant farm data come from the supply partners and dairy industry. Although farmers' organisations in Netherlands take effort to make data interoperable, it's still a heavy job to collect all data in a way that farmers take better decisions.

Therefore, ZLTO advisors try in this Use Case to collaborate on data driven decision support/advice.

1.2 Future in context of history: learning history

Stages in the ZLTO dairy advisory team

History	Key lessons learned
Started with 'dairy mirror' 26 questions for individual conversations	Good question is important but don't lose contact after it.
Next step: data from mineral balances (additional to accountant) , to use individual	The mineral cycle gives checks and controls
Uniform data set in spreadsheets, to use in study groups ('double lifecycle dairy' project): basic overviews (breeding young animals)	Preparation of data is inevitable, but heavy job. Takes time to get experienced
Add 180 graphs, selection 4 per farmer	Graphs speak better than figures
Plan do check act: in ½ year reals change in business and results	Don't lose contact after you gave an advice, continue for benefit
Team On Data Driven Dairy Advice	The team brought continuity, e.g. by meeting each week and discuss complex cases.
Flexible web advisory tool (instead of spreadsheet/PowerPoint) with tailored overviews and Pdf reports	To go from spreadsheet to professional support of exchange is exponential increase of development costs. You make yourself dependent of specific partner. Spreadsheet keeps flexibility. Good support is crucial, best to have in house.

Opticow online: for bigger audience (all dairy farmers NL)	No result yet, we hope to expand
New modules like biodiversity benchmark.	Very dependent on consensus in the data creating industry
Development of separate tool development and advice team support	Advantage of separate tool development: more ICT focus, disadvantage: less farmers focus
UC: collaboration with strategic partner on animal health and welfare.	Slaughterhouse can give new information of health, welfare etc.

Summary learning experience and challenge:

ZLTO advice team has made a development to a stronger timely input of data and competence to give the right advice based on these data.

Future:

Now the team wants to make a step forward to more impact of advice.

Therefore, ZLTO advisors try in this Use Case to collaborate on data driven decision support/advice.

1st result: D4.3 in M30: how will partner come to deliverable 4.3 (lessons learned).

1.3 General assessment of adoption

Assessment general:

Milestone	Date	Users advisors	Appreciation	Use at farms	Appreciation	remarks
Test done	Dec 20	3	7/10	5	8/10	
Intro done	Mar 21	5	8/10	20	8/10	Less time/farmer

1.4 Factors influencing the current status of DATS in the UC

	Chance to happen	Positive/negative	impact
Choice of Slaughterhouse as partner makes adoption stronger,	90%	++	100%
but may be of influence to vets, cow traders, ++	30%	-	30%

1.5 Vision

General overview:

- ZLTO Advisors are farmer focussed, tools should ease that work, time investment in preparation is perceived as burden

- Vion advisors are farmer focussed, but also need to keep the farmers as suppliers of their slaughterhouse, link with supply advantages needed
- ZLTO management focusses on quality advice for same price as competitors. In projects focus is on Climate, Health, Rural processes. Tools refer to the 1st 2 themes.
- Vion management focusses on *Building balance chains to change and strengthen the supply chain, from farm to fork*. Focussing on features that maximize onboarding and participation of farmers advisors, vets, etc.

1.6 Action plan for adoption

Action plan for adoption (made more specific in Action Plan WP5)

Action	Target group	Target	Timing
Strategic collaboration with VION (slaughterhouse with advisors)	management	Agreement whitepaper	Oct 20
Operational planning	VION Senior advisors	Advice plan	Nov 20
Test advice for farmers, supplying VION	Selected farmers	5 farmers tested	Dec 20
Evaluation, practical adaptations/ workarounds	Senior advisors	Evaluation meeting	Jan 21
2 nd group of farmers	Selected farmers	20 farmers reports	Mar 21
Evaluation and adaption of tools	ICT company, advisors	Adapted plan	Jul 21

Y1 y2 y3

When to make, revise, what at the end of the experiment

1.7 Business case (shown in D6.1)

1.8 Cross Visits

ZLTO will organise a Cross Visit; Content: Discuss on specific challenges of advisory and supply chain partner. Cross Visit could be combined with Belgium. and prefers to visit Croatia, Germany, DK, Ireland, Portugal, France.

1.9 Training, fostering adaption of DATS

Include training/ develop skills, and action points for workshops, translation/adaption

Ivonne de Bruin / Evy Kras will contribute to the development

7.11 INTIA

INTIA Overcoming the challenge for advisors of sharing and keeping knowledge and expertise using DATS

1.1 Identification of the needs/challenges advisors face

In INTIA, advisors have great experience and generate many relevant data and knowledge. They have regular meetings for sharing experience and knowledge with other advisors. Besides these meetings they usually use WhatsApp or mail in case they consider an event to be shared with the rest of advisors or even to ask for colleague's advice.

When they take a photo of an issue in a crop, they usually load them in a common folder or during last years they would send it by WhatsApp. All these photos and the additional comments regarding this issue (pdf, spreadsheet...) are usually forgotten or lost because they can't access easily to them when they are needed in next campaigns.

Advisors have the challenge of exchanging internally valuable knowledge. All the expertise generated in this kind of communications should be recorded in a database, for generating knowledge and data for future advisors or future events, even more they have the need to link their activities to the knowledge generated in other areas such as, demonstrations, trials and projects, which are in charge of feeding technical advice.

Apart of this, INTIA advisory service faces the challenge of spreading all the recommendations and prescriptions to farmers. They usually use traditional way of advising (face to face, email, phone, newsletter...) and recently by WhatsApp and social media. Advisors have the challenge of reaching as many farmers as possible and it would be convenience to register and record easily all the prescriptions that they emit to farmers.

1.2 Learning history or Future in the context of history

Stages in INTIA's UC and key lessons learned

History	Key Lessons learnt
Group advisory emails for sending relevant information internally and externally	Set up automatic email response to those that register. Mails doesn't facilitate saving data obtained and knowledge generated in the advice

Group advisory WhatsApp for sending relevant information internally and externally	Set up automatic email response to those that register. Mails doesn't facilitate saving data obtained and knowledge generated in the advice
Common folders for keeping relevant information in a centralized resource	Advisors have to know the existence of this information and these folders have to be updated. This task is not always easy.
Regular meetings for sharing experience	Meeting each week and discuss issues. Advisors have to be motivated and encouraged to deal with different cases
Live streaming, videos (recently, because of COVID-19)	Wide dissemination in covid-19 situation. Videos have to be grouped in folders for facilitating the access for those who missed scheduled screening.
Social Media	Wide and direct dissemination but this is not for transferring detailed information
Newsletter NAVARRA AGRARIA	Wide dissemination. The main problem is that it reading is not immediately.
Phone	Quick advice but doesn't facilitate saving prescriptions and advice

INTIA team advisors make a great effort to be up-to-date in all the emerging techniques in agricultural and livestock sectors besides the transfer of all the knowledge and share similar experiences "peer to peer". It is complicated to keep track of all the information and to access of all this work rapidly when they really need it even more when the knowledge is among different areas or sections.

Now the team wants to make a step forward to enhance their advice. For that reason, they have the challenge of exchanging and recording valuable knowledge, data and prescriptions, generating a database of knowledge and information.

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Approval	Use at farms	Approval	remarks
Feedback from advisors	M5 2021	3				
First Test Practical	M7 2021	3	6/10	1	6/10	

adaption of tools						
Second test Adoption	M10 2021	5	8/10	1	8/10	

1.4 Factors influencing the current status of DATS in the UC

The success of the DATS will be influenced by how much advisors believe they need support for their communication and knowledge exchange. Another point is that DATS have to be user friendly. Added to this, new technologies are struggling for acceptance in advisory teams especially with older generations. Communication between advisor-farmer must be simple and not complex.

	Chance to happen	Positive/negative	impact
Advisors using new technologies	60%	+	Large
User friendly DATS encourage advisors to use them	90%	++	Large
Get used to saving all the information	50%	+/-	Medium
Knowledge is kept in the firm for next generations	90%	++	Large
Communication and feedback between different areas	50%	+	Medium
Easily access to data	80%	++	Large

1.5 Vision

The tool will consist of a database in which advisors can save all the information related to a plot, a crop, or even livestock with photos, notes, recommendations, or any relevant information they consider in real time. This tool has to be easily accessible for another advisor with the same kind of issue. This tool will let advisors share internal knowledge facilitating the work of advisors. So, advisors will use this DATS to facilitate the saving of the information and knowledge generated in the advice, therefore it will be available as a "history of the plot" and can be consulted when an issue is detected or simply for monitoring farm information. This information could be in different formats, such as photos, pdfs, spreadsheets...

Apart of that, this DATS may increase their ability to exchange knowledge and prescriptions with farmers allowing them to access to determined information. This should increase farmer willingness and ease to use the DATS.

This tool will be used for crops, horticulture and livestock.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Workshops among advisors/ Build a peer-to-peer learning among advisory services	Advisors (senior/junior)	Create an atmosphere for sharing knowledge	Jan 21
Set up plan for sharing information	Steering Comitee	planning	Feb 21
Evaluation of tools	Advisors	Adapted plan	May 21
Practical adaption of tools/ workarounds or development of a new one	ICT company, advisors	Adapted plan	Jul 21
Start of the adoption	Advisors	Advisors become familiar with the tool and give make suggestions for the improvement	Ago 21
Enable advisors to use the DATS	Advisors	Training courses, coaching	Sep 21
Use of the tool by all advisors	Advisors	Advisors use the tool	Oct 21

1.7 Business case (shown in D6.1)

1.8 Cross Visits

INTIA would like to organise 3 cross visits to show and compare information strategy and systems with other rural advisory companies. It would be interesting to know about challenges of advisory sharing knowledge in Ireland, England and The Netherlands. If it is not possible a face-to-face cross visit, they will be online in the workshop format.

1.9 Training, fostering adaption of DATS

Include training and action points for workshops, translation/adaption. First, a sample of advisors will be trained in the usage of the DATS. Once the pilot is completed, training sessions we will run with all the advisors in our firm to



enhance the adoption of the DATS on a large scale. With the aim of fostering the adoption of tool, we consider really important the peer-to-peer strategy, so we will establish advisory groups made up of experienced advisors with others who have never used the tool.

7.12 I4Agri

Innovation for Agriculture (I4agri) Overcoming the challenge of on farm meeting restrictions for farm advisors by choosing appropriate DATS and their remote use.

1.1 Identification of the needs/challenges advisors face

There is an emerging need for remote consulting in the agricultural industry. Many farm advisors and vets are not able to meet with their farmer clients due to COVID – 19 crisis, with both lockdown restrictions and economic difficulties posing barriers. Advisors may also experience similar meeting restrictions for a variety of other reasons too, such as the bad weather.

So, advisors have the challenge of exchanging valuable knowledge about best practices and animal husbandry without the ability of face-to-face meetings and on farm consultation. A new way of communicating remotely with their farmers clients that allows them to share knowledge and best practices and improve interaction, is needed now more than ever.

Farm advisors have seen that the Online Agricultural Show tool with the use of the video platform plus other features to develop, such as live chat room, etc., may well fit to their needs for remote consulting. The platform can be used to share and discuss farm advice remotely. This can be set up either as timed sessions, or replay able sessions for farmers to follow at a time and pace that best suits them. The main focus has been on ensuring that the tool was user friendly and easy to use, therefore generating high levels of site hits, which in turn delivered successful levels of knowledge exchange. The online agricultural show received over 50,000 website hits within its official 'show' day. Advisors reported successful levels of interaction via the live chat facility and the educational videos generated high numbers of views.

The Online Agricultural Show was originally created to meet the needs of the agricultural community in participating in the agricultural shows during meeting restrictions. The agricultural shows are important events for the agricultural community, not only for business purposes but they also play an important role in the social calendar for often isolated farmers. Businesses that would normally meet potential customers at shows, were able to have a customizable trade stand and farm advisors could showcase informative videos to farmers. There were also online classes for livestock competitors.

In regards with the crop sector, and in particular with the carbon fluxes in agricultural systems, that recently draw attention as Carbon rapidly became a new priority within the industry, advisors and agronomists, are seeking digital tools and their remote use to advise farmers on the best actions to reduce emissions and better capture and sequester carbon.

To date, advisors and agronomists have mainly used carbon digital tools with farmers in ‘on-farm’ situations and have found it difficult to compare the strengths and weaknesses of different tools and their suitability.

With current and post Covid19 challenges, there is a growing need from both of them, to be able to:

- (i) better assess the strengths and weaknesses of digital carbon assessment tools and their suitability to individual farming businesses through comparative assessment.
- (ii) be better able to use these digital tools remotely so as to overcome on farm meeting restrictions.

Addressing these needs will help and better equip advisors and agronomists with an improved method of choosing the most appropriate digital tools that help them assess on-farm carbon footprints, losses, gains and opportunities for sequestration. These will help change practice and behavior to be better able to remotely access, inform and use the digital tools to provide information on which advice and guidance can be based.

1.2 Learning history or Future in the context of history

Stages in I4agri’s User Case and key lessons learned

History	Key Lessons learnt
Pre-registration pages - Database of contacts from which group emails can be sent	Set up automatic email response to those that register, with key information
Custom trade stand areas - Customisable page with live chat and live video features.	Set up automatic passwords so businesses with authority to make pages don’t need to wait for personalised responses from web team
Display arena and lecture theatres - Linked to YouTube or vimeo account, put on a timetable.	Videos best grouped in folders in YouTube/vimeo account. Videos also should be viewable anytime for those who missed scheduled screening. Easy page for visitors to use
Page traffic monitoring – database showing the number of visits to each trade stand and each area of the website. Was useful to see which areas were most appealing/relevant to users and to provide feedback to trade stands.	This data is anonymised so we cannot get demographic information of visitors

<p>Livestock show - Facility for individuals to upload pictures, and a selected person to view and provide feedback</p>	<p>This was done by a second organisation but due to communication delays, it would be better to become an in-house feature. Visitors found it difficult to use. 'How to' videos useful to talk users through the more difficult software.</p>
<p>Beer tent – done by a third organisation. Facilitated live streaming and large group discussions</p>	<p>Would be incorporated in-house. Was very popular with website users. Easy to use</p>
<p>FEEDBACK FROM USERS/ADVISERS</p>	
<p>Unexpected take off from advisors</p>	<p>Learnings from the pilot (based on trade stand feedback)</p>
	<p>The playback feature of the video theatre means that more farmers can be reached as there are no time restraints</p>
	<p>The stand visit counter meant we could have accurate data on number of people reached – could this be enhanced to gather demographic information</p>
	<p>As advisors our aim when attending agricultural shows is to meet contacts and make links with members of the industry. We anticipated being unable to make the same connection with attendees through the online show format, however, this issue was overcome by the use of a live chat facility within each trade stand. This meant that we could have easy, instant conversations with people in the same way as we would at a real show. We also found visitors who maybe feel shy asking questions face-to-face when on a trade stand, were more willing and confident to start the conversation through the digital technology provided via the online ag show. Our only suggestion for future virtual events would be to have a 'sign up' facility enabling visitors to easily provide their contact details</p>

	so we can continue to develop the relationship following on from the event.
IFA identified a need for the development of a decision support tool to enable advisers & agronomists to comparatively assess the strengths and weaknesses of different soil assessments and services.	Farmers and advisers surveyed to determine need for decision support tools
Better selection of digital soil assessment DATS appropriate to farming business information needs.	Decision support tools that aid comparative selection of appropriate tools are in high demand
Advisors & agronomists need to assess carbon on farms to bring about practise and behaviour change to address climate change challenges	Climate change brings an increased need to assess farm carbon stocks and sequestration potential so as to provide advice on practice and behaviour change
Advisors & agronomists find it difficult to choose carbon DATS best suited to individual farming businesses	Advisors and agronomists find it difficult to choose the right carbon DATS for each business
Advisors & agronomists find it difficult to use carbon DATS remotely	There is a need to adapt use of carbon DATS for remote use

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Approval	Use at farms	Approval	remarks
The Online Agricultural Show platform						
Test done	February 2021	3	6/10	5	6/10	
Second test	April 2021	5	8/10	15	8/10	
Carbon theme and Decision Support Tool (DST)						
I4agri Decision support tool adaptation	June 2021					
First testing with advisers and	June 2021 July 2021	5+5 = 10		10		

farmers & Evaluation						
Second testing with farmers and advisers	August 2021	10+10 = 20		20		
Assess remote use	Sept 2021	5		5		
Evaluate adaption & adoption	Oct 2021	5		15		

1.4 Factors influencing the current status of DATS in the UC

The success of the DATS will be influenced by how much advisors believe they need online support for their communication and knowledge exchange with their farmer clients, by the increased demands for carbon assessment tools, and the ability to select the right tool(s) for individual farming busines. This will be affected by (preliminary results):

- How comfortable farm advisors are with using new technology.
- How much on farm communication is reduced?
- How comfortable farmers are in using new technology.
- Good network connections will affect how successful the uptake would be.
- Increasing climate change pressure to sequester carbon on farm
- The development of carbon sequestration markets
- The increasing number and choice of different carbon assessment tools
- Effective comparison between the strengths and weakness of different carbon assessment tools
- The need to assess and select carbon assessment tools suitable for individual farming businesses

Experience from practice, shows that the Online Agricultural Show has been successful as it encourages those who are not convinced of the benefits of the tool and service, to try it as the user does not need to invest in it.

It has prioritised the look and feel of the site which we believe has been a main contributor to its success.

And it has been an exciting and engaging way of delivering knowledge exchange using a fun and interactive media.

Experience from practice, shows that the I4agri's soil assessment decision support tool has been successful as it encourages those who are not convinced of the benefits of the tool, to use it to compare different analysis types and services and to select the most appropriate soil analysis and services to meet farm information needs. With routine farm soil assessment now legislated, the decision support tool has assisted advisers and agronomists in the selection of analysis choices and services appropriate to individual farm needs.

	Chance to happen	Positive/negative	impact
Advisors less willing to have on-farm visits	60%	+	75%
Farmers become more confident in using technology	100%	+	100%
Advisors cost cutting and reducing spending as off recession	50%	-/+	50%
Comparative assessment of soil analysis methods and services	70%	+	80%
Farmers become more confident in using soil assessment	100%	+	100%

1.5 Vision

Farm advisors/vets are struggling to meet with farmers given the COVID-19 restrictions. Farm advisors may wish to use this DATS to increase their ability to exchange knowledge remotely with their farmers. The DATS is interactive and allows for communication between the farmer and their advisor. The knowledge exchange can be aired at a set time, or pre-recorded with the ability to playback, allowing farmers to access the information at a convenient time for them. This should increase farmer willingness and ease to use the DATS. The live chat facility for farmers and advisors will be improved, and an innovation hub which now features over 80 educational videos and best practice guides will be extended. The platform can monitor the number of individual user visits and return visits to the website and to specific pages. Previously, farm visit was a sign of adoption, now these data will show that there is an increase in uptake from farmers.

Farm advisors are also struggling to choose between current and the increasing number of carbon assessment tools, in order to select the tool most appropriate to individual farming business structure and information needs.

Adapting existing decision support tools for use with carbon assessment DATS and their suitability to individual farming businesses, will enable advisors and agronomists to choose appropriate carbon assessment tools and provide carbon assessments to farmers remotely given the COVID-19 restrictions for on-farm meetings and assessments.

Previously, through farm meetings, the increased requests for carbon assessments were a sign of adoption. With COVID-19 restrictions this demand has not been met. Adapting the DATS for remote use will increase uptake from farmers.

1.6 Action plan for adoption

From learning history, we will identify and enhance the most useful and beneficial aspects of the platform to suit the needs of the farm advisors and provide the options that work best for them.

Action	Target group	Target	Timing
Collaboration with livestock vets interested in animal health and welfare advise	Farm advisors/vets	Agreement whitepaper	Nov 2020
Operational planning	Farm advisors/vets	Advice plan	Jan 2021
First test	Selected farmers	5 farmers tested	Feb 2021
Evaluation, practical adoptions/ workarounds	Farm advisors/vets	Evaluation meeting	March 2021
Second test	Selected farmers	15 farmers reports 5 farm advisor reports	April 2021
Evaluation and adaption of the DATS	ICT company, farm advisors/vets	Adapted plan	April 2021

Regarding, the soil carbon theme, from learning history, we will identify and enhance the most useful and beneficial aspects of the decision support tool already developed for soil assessments and services to provide a decision support tool for the comparative assessment of different carbon assessment tools, to suit the needs of the farm advisors and provide the options that work best for them.

Action	Target group	Target	Timing	
Operational planning	Farm advisors/vets	Advice plan	May 2021	
Adapt soil decision support tool into a decision support tool for selection of appropriate carbon assessment tools to meet farm business needs	Farm advisors/vets	Agreement whitepaper	June 2021	
First adviser test	Selected Advisers	5 advisers tested	June 2021	
First Farmer test	Selected Farmers	5 farmers tested	June 2021	
Evaluation, practical adaptations/ workarounds	Farm advisors/farmers	Evaluation meeting	July 2021	
Second adviser test	Selected advisers	10 adviser carbon assessment reports	August 2021	
Second Farmer test	Selected farmers	10 carbon assessments implemented by farmers	August 2021	
Assessment of remote utilisation of decision support tool	Selected farmers and advisers		September 2021	
Evaluation and adaption of the DATS	ICT company, farm advisors/farmers	Adapted plan	October 2021	

1.7 Business case (shown in D6.1)

1.8 Cross Visits

The cross visits might be virtual depending on the restrictions in place due to the Corona crisis. 3 project partners will join on line to share good practices and

different approaches to use of DATS and link with T6.1 business case and vision and roadmap. The challenges that farm advisors in the visited or ‘virtually visited’ countries face, will be discussed, and solutions provided by the DATS will be examined. Ireland would be suitable to start with, due to the similar agricultural systems. Other possible cross visits could be one of France, Netherlands, Germany or Switzerland as they either have a large number of, or geographically remote, sheep farmers. As such it would be useful to discuss how they overcome the similar challenges that our advisors face.

Ireland would also be suitable to start with, in regards to the carbon assessment tool, due to the similar agricultural systems and existing interest in carbon assessment. Other possible cross visits could be to France, Germany, Denmark or Switzerland as they are active in undertaking and developing farm carbon assessments.

1.9 Training, fostering adaption of DATS

The training will be supported by the use of webinars.

Feedback from training will be gathered online. Philippa Gray, Stephen Briggs, Deborah Crossan from I4agri will lead some training sessions on the DATS.

7.13 CAJAMAR

CAJAMAR / Digitalizing the advisory activity for greenhouse-grown vegetables in South-East of Spain

1.1 Identification of the needs/ challenges advisors face

Vegetable production under greenhouse is an important sector in Spain, mainly located in the south-east of the country and specially in Almeria province, where the mild winter climate conditions allow such a production in simple greenhouse structures (mainly ‘parral’ type greenhouses) with a very low energy supply (usually without heating). This has permitted to reach the highest concentration of greenhouses in Europe (by 32,000 hectares only in Almeria).

This agricultural activity maintains a huge number of advisors, more than 1,000 including both those working at the cooperatives advising the growers and those employed in the auxiliar industry. In this way, growers are visited by advisors with a high frequency (every 1-2 weeks) to track the quick changes that the crop can have in this growing system.

However, a higher level of greenhouse monitoring would be necessary in order to improve the decision making. The problem related to this issue is that an important investment should be done by the growers, who are reluctant in many cases because it is not easy to identify those technologies actually profitable. The adoption of DSSs calibrated to the local conditions can also be useful for decision making.

On the other hand, a digital on-farm storage of the recommendation given by the advisor would be interesting for its direct registration and communication to the grower, in connection with the field diary, and the ERP of the cooperative. The advisors of the cooperatives are starting using mobile applications for this purpose (e.g., Campogest, Hispatec S.A., Spain), but these tools are not currently enough comfortable to be used directly in the field and, in practice, advisors follow giving a written recommendation, which is digitalized later, with the consequent loss of time.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
In the last 15 years, Cajamar has developed or has contributed to the development of several DSS oriented to vegetable production under greenhouse, which work as stand-alone software.	DSS are useful tools for growers and advisors, but they must be easily available to be used as efficient tools for daily work.
Cajamar is launching soon its own digital platform (www.plataformatierra.es)	The idea is to compile information and tools useful for the final users in a web platform, thereby integrating both own DATS and interesting digital tools from third parties.

<p>HISPATEC is an IT company focused on agribusiness. It has more than 30 years of experience working in the digitalization of the agri-food sector. It has 150 employees with deep experience in analyzing, designing, development and deployment of ITC solutions for covering all the processes in the whole value chain (www.hispatec.com)</p>	<p>The solutions must be easy to use for the farmers and it must provide the key information for the decisions. Raw data must be used for DSS calculation, but the farmers must access only to the results which are the key data for making decisions.</p>
<p>HISPATEC has two types of IT solutions:</p> <ul style="list-style-type: none"> - ERP focused on agri-food value chain that is complemented by a complete mobile and WEB ecosystem. - BIGDATA and Artificial Intelligence platform for covering on-line analytical processing based on SMART Farming, IoT solutions, Ag-Industry, Logistic and, in general, descriptive, prescriptive and predictive analysis. 	<p>It is necessary to work with mobile solutions where all the key data must be shown. Farmers are always in the field monitoring their crops; therefore, they need a solution in their SMART phones / tablets to enter DATA and to obtain KPIs in real-time in order to make decisions based on DATA.</p>

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Agreed changes in the app	2-2021	5	Hispatec			
Launch v1	6-2021	5		10		
Feedback from the advisors	10-2021	5				
Tool for estimation of fertigation accessible in the digital platform	12-2021	Open to the public	Cajamar			
Launch v2	2-2022	15		100		
Feedback from the advisors	4-2022	15				
Launch v3	6-2022	50		1000		

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/negative	impact
HISPATEC is leading company in software solutions for agriculture in Almeria and is motivated to improve its tool. This facilitates the adaption of the tool.	80%	positive	Large
However, it prevents the participation of those cooperatives using other software solutions.	90%	negative	Medium
COEXPHAL is the association of organizations producing vegetables in Almeria and groups 65% of such a production in the province, having a strong relationship with the advisors of the cooperatives. This makes more feasible a real adoption of the tool.	60%	positive	Medium
CAJAMAR is launching a digital platform where several DSSs calibrated for the local conditions under greenhouses will be integrated after adaption in order to facilitate their use for the final users.	90%	positive	Large
Work overload of advisors	50%	negative	Large

1.5 Vision

To develop a quick and easy to use App for the digital on-farm registration of the advisor recommendations, as well as a practical tool to give recommendations on fertigation.

1.6 Action plan for adoption

Action	Target group	Target	Timing
Collaboration with HISPATEC and COEXPHAL	Management		Dec 2020
Launch CAJAMAR's digital platform	Cajamar	Platform operative	Jan 2021
Establish a working group	Senior advisors		Jan 2021
Analysis of the digital App and proposal for adaption	All involved		Feb 2021
Adaption of the App	Hispattec	V1 of the App	Feb-Jun 2021
Adaption of VegSyst-DSS	Cajamar	Equations defined to be converted into software	Apr-Jun 2021
Test of the App	Senior advisors		Jul-Sep 2021
Translation into software of adapted VegSyst-DSS	Cajamar	Tool for estimation of fertigation accessible at the digital platform	Jul-Dec 2021
Evaluation	All involved	Evaluation meeting	Oct 2021
Adaption of the App	Hispattec	V2 of the App	Oct 2021-Feb 2022
Test of the App	Senior advisors		Mar 2022
Evaluation	All involved	Evaluation meeting	Apr 2022
Final adaption of the App (if necessary)	Hispattec	Final version of the App	Apr-Jun 2022
Extended use of the App	Senior advisors		From Jul 2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

A cross visit will be organized to know about challenges of advisory in high-tech greenhouses in The Netherlands/Belgium. Interactions with other Mediterranean

greenhouse areas (Greece, Portugal) can be carried out to share experiences of digitalization.

1.9 Training, fostering adaption of DATS

Training sessions will be carried out to disseminate the digital tools developed in the frame of the user case.

7.14 CONSULAI

MobITAlqueva – Mobilizing Alqueva Region with an Information Technology tool - AgroBI - to gather different data sources with useful and timely information for decision making in the Alqueva Region.

1.1 Identification of the needs/ challenges advisors face

Any company records and compiles information, but few can access the wide range of historical data safely and quickly. On the other hand, data comes from various sources and different databases.

In fact, Excel is a tool that we all love and is a great technological invention, but unfortunately it does not solve all problems.

We have only just started working with Business Intelligence and we already have a lot to offer, but the opportunities have just begun...

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Digitisation in agriculture in Portugal and precision agriculture has evolved considerably in recent years	Although it is an evolutionary process, precision agriculture and process digitization are here to stay
The installation of sensors and other data-generating equipment has multiplied on farms, making consolidated and reliable interpretation difficult for farmers and advisors.	It has become necessary to develop real decision support tools, which combine multiple data generated on farms
There are lot of software currently available for data interpretation, but they involve monthly fees, or even regular updates.	The goal should not be to develop more software, but to use platforms already available by most users (e.g., Microsoft) and to develop a “Taylor Made” data aggregation, consolidation, and interpretation service, according to the needs of each farmer / advisor
We have developed a service based on Microsoft's Power BI tool, to comply with farmers' needs: <ul style="list-style-type: none"> ▪ What data should I have on my farm? ▪ What information should I consult about my crops? 	Farmers often do not have the perception of what they need. On the other hand, they do not perceive the added value of such a service. They often need to see a success story to decide on the strategy to follow. Another scenario could be to develop a case study not for a farmer, but for an entire

<ul style="list-style-type: none"> Make me a dynamic and up dated dashboard to manage my crops 	<p>region, increasing the impact of the solutions developed and allowing the performance of benchmarking of each farmer, and of the whole region in which they are included.</p>
<p>Alqueva Dam, managed by EDIA, is the largest artificial lake in Europe, an immensity of water to lose sight of, surrounded by an enviable natural landscape. The objectives of the construction of the Alqueva Dam had to do with the production of electricity, but above all, for the creation of an irrigation system for the whole Alentejo area. This is a way to develop agriculture and thus also to confront the problem of land abandonment, but only if in a sustainable way.</p>	<p>AgroBI can be applied to this Region, to define sustainable criteria, with impact on the rational use of natural resources in the irrigated crops of Alqueva.</p>

1.3 General assessment of adoption

Set milestones and targets for adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Indicators defined	M5 2021	20 farmers	15 in 20	20	15 in 20	
1 st version of Dashboards	M6 2021	20 farmers	15 in 20	20	15 in 20	
Final version of Dashboards	M8 2021	20 farmers	20 in 20	20	20 in 20	

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/ negative	impact
Definition of the different indicators to be monitored	Medium	negative	Medium
Access to different data from various sources and software's	Medium	negative	Large
Region stakeholders engaged	High	positive	Large

COVID-19	High	negative	Medium
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1.5 Vision

Today, we live in a period where increased productivity must be linked to a more efficient use of resources (producing more with less, and above all with lower costs), thus improving the competitiveness of farms. Similarly, we are committed to sustainability, reducing the pressure on the agricultural sector, which will have to feed 9 billion people by 2050. The goal is for agriculture to be able to do this without putting even more pressure on the use of natural resources (water, energy, soil, ...). This issue is also related to the problem of climate change and its impact on agriculture. In this sense, we need an engaging project that defines productivity and sustainability indicators, that interconnect them and that contribute to a greater sustainability of a Region without compromising its agricultural potential. “**MobITAlqueva - Mobilizing Alqueva** Region with an **Information Technology tool - AgroBI**” is an opportunity shared by all agents in the region.

1.6 Action plan for adoption

Action	Target group	Target	Timing
INFORMATION GATHERING	Farmers of Alqueva irrigation systems	-Defined indicators -Data sources	M3 2021 M5 2021
DEVELOPMENT	Alqueva’s stakeholders	Producing different dynamic dashboards	M8 2021
VALIDATION	Alqueva’s stakeholders	AgroBI of MobITAlqueva validated by EDIA	M10 2021
DISSEMINATION	Farmers, Advisers, Competence Centers, Policy makers	Dissemination activities at National and International level	From M11 2021 to M6 2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Two cross visits will be organized:

1 – including the farmer’s and advisory community of Alqueva region, covering different crops and production methods.

2 – Portuguese Regional administrations, policy makers, advisors, and farmers from other Portuguese regions.

Note: If not possible a face-to-face cross visit, we are prepared to develop two “Farminars”.

1.9 Training, fostering adaption of DATS

Two training sessions will be developed (farmers and advisors): Face to face training & Online training session.

7.15 IDELE

IDELE user case: enlarging the decision tool use, COUPROD, to improve livestock farmers competitiveness.

1.1 Identification of the needs/ challenges advisors face

Facing the variability of the markets' trends, understanding how much it costs to produce something and how costs are structured is fundamental to any farming enterprise. It helps to evaluate the farm competitiveness on any market. Costs of production evaluation highlights farm strength and weakness to face any strategic opportunities.

In 2010, in order to help farmers inputs and energy costs increasing, IDELE - French Livestock Institute produced a national method to calculate the cost in a livestock herbivore production. This method enables to determine a calculation suitable to the characteristics of livestock farms which are very often diversified and enables the cost of production evaluation for dairy, beef, sheep and goat production such as for crops activities.

First method proposed at the national level, this method was recognized again to allow the comparisons with other countries, as it was built in concordance with economic network such as IFCN (International Farm Comparison Network) for dairy production and agri benchmark for beef and sheep meat production.

This method is nowadays available to advisors working with livestock farmers. It has been displayed on farm with a software, COUPROD, established with a national partnership in order to provide advisors and farmers with a sustainable IT application.

Its missions are as followed:

- To calculate the production costs of different activities in the enterprise, the costs price and the labour remuneration.

- To help in strategic decisions by using benchmarking and farm comparison.

The tool also serves as a basis for the development of benchmarks which are integrated to the software and mobilized during the presentation of the results. The repositories are updated regularly to be as close as possible to the economic situation analyzed.

In 2020, 470 advisors are constant COUPROD users from different organisations (chambers of agriculture (46%), cooperatives (24%), genetic companies (22%)...). Involved in more than 3200 calculations per year, they regularly express their demand for new DATS progress to improve their farmer assistance and to point out factors involved in the farm rent ability.

The ambition of this project is to enlarge the COUPROD use in the advisor population and to ease their farmer assistance. A novel action is planned to provide advisors and farmers with decision table where they can evaluate the competitiveness through several accurate criteria and references. The intention is to co create these new applications.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
At start, in 2010, Idele developed a national method for production costs, used for benchmarking.	Difficulty to get a standardized economic analysis on cost of production at the farm level.
Implement a cost of production method usage: collecting data + gather result in farmers groups	The method faced a big success on the field. The advisors found their place in assistance (collecting data, featuring results and providing groups with comparison figures and graph). Farmers learnt about economic analysis.
Implement a cost of production method for national stakeholders	The method has been validated at a national level to evaluate the real farmer cost, included in market benchmark tool.
In 2015, embedding the method on a national tool dedicated to advisors	Partnership established in order to fit to the users needs and to prioritize DAT functionalities.
Governance established in order to insure the DATS sustainability	Partnership to strengthen the business model (invests and maintenance costs)
Farmer Demand for self-evaluation.	New tool implemented for data transcription and self-evaluation. In complementarity with advisor benchmarking.
Advisors demand to new thematic exploration: feed cost implementation, labor cost evaluation, mechanic cost explanation and management	New tools to built and test with advisors.
Advisors demand for annual data set compiling figures for areas/systems/productions..	New platform of data set available for advisors.

1.3 General assessment of adoption

The software maintenance is highly expected in order to give more services and added value to advisors.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Advisors focus group	Nov-déc 20	25	8/10	25	8/10	Interest to explore the data base valorisation
Test	Ap-may 2021	25	8/10	25	8/10	Advisors agreement

1.4 Factors influencing the current status of DATS in the UC

The success of COUPROD improvements will depend on the right answer to the expectation.

Focus need emphasis:

- How those evolutions ease the use.
- How it gives some novel data to explore with the farmers
- How it helps advice efficiency;

Factors	Chance to happen	Positive/ negative	impact
Co-creation with users	90%	++	Large
Advisors training	90%	++	Large
Farmers implication	90%	++	Large
COUPROD data relationship with other DATS	90%	++	Large

Factors influencing:

- Encouraging the farmer implication by the expansion of a web platform dedicated to self-evaluation in relationship with the advisor assistance.
- Facing the data transcription. Most of information are recorded from accounting documents. The objective is to reduce the time in data filling by interoperable technics between DATS.

1.5 Vision

One of the Idele missions is to provide advisors from any kind of assistance support services with tools and references. COUPROD has been established on a national partnership with the objective to disseminate a common method of cost of

production calculation. This method is partly used internationally in the IFCN and agribenchmark networks.

Since 2 years, the expansion of COUPROD usage faced a flat top. That's why the idea is to provide advisors and farmers with new applications in order to invest new functionalities.

Two ways are suggested:

- Setting a national data set compiling figures for areas/systems/productions and available on farm.
- Providing advisors with new tools to explore feed cost implementation, labor cost evaluation, mechanic cost explanation and management

1.6 Action plan for adoption

Action	Target group	Target	Timing
Advisors survey and focus group	Advisors	Agreement	End 20
Advisors group for co creation	Advisors	Meeting	April 21
Advisors group for co creation	Farmers	Meeting	Mai 21
Implementation of new applications and data set	Advisors	Action plan	June 21
Tests	Advisors and farmers	5 farms advices tested	Sept 21
Advisors training	Advisors	Advisors	Oct 21

1.7 Business case (shown in D6.1)

1.8 Cross Visits

The team will organize cross visits i.e., presentation of the DATS, its uses, user case testimonia (advisors and farmers). If necessary, those cross visits will be converted in virtual meeting.

1.9 Training, fostering adaption of DATS

The training will be organised by the use of webinars.

1.10 Translation

The DATS dissemination will be helped by the translation of user interfaces, instruction manual, method explanation and training support.

1.11 Business model

The COUPROD DATS is delivered in exchange of a licence payment covering the maintenance and informatics hosting costs.

Annexes:



COUPROD, an advice tool for farmers

This advice tool has been developed by the French Livestock Institute (Institut de l'Élevage) from a proven method enabling each farmer:

- To calculate production costs of his various livestock enterprises, the cost price and the farmer's work remuneration given by total returns,
- To make strategic decisions by comparing his enterprise results to others.

This software can be used either through an individual advice or focus groups. It makes it possible to the largest number of producers to analyse their results, to identify improvement levers and to simulate the impact of a new environment on their farm.

COUPROD is well adapted to all the livestock farms (dairy and beef cattle, dairy and meat sheep, dairy goats); it makes it possible to dissociate livestock costs from those related to crops.

The Web option allows farmers to learn how to calculate the cost of production and to take better control of the management of their farm. For students, using Couprod based on the results of a farm is a good way to learn about the method.

For more information: couprod.fr



This software has been funded by the Confédération Nationale de l'Élevage (CNE) and FranceAgriMer (Agriculture and Seafood Board)

7.16 NAK

NAK-Hungary; Standard Production Value (SPV) calculator

1.1 Identification of the needs/ challenges advisors face

The Standard Production Value (SPV) calculator is currently available on the official portal of the NAK, which provides significant assistance to farmers/advisors in calculating the production value in the case of Rural Development Program applications. The aim of the development is to update and supplement the SPV calculator with the utilization codes used by the Hungarian State Treasury and to introduce new functions for appropriate calculation.

The STÉ calculator app was launched in 2015 on the NAK website. In 2016, there was a minor development on the app. For this reason, it needs to be updated. It is necessary to expand the agricultural sectors + groups, so that it can be used by advisers and thus help farmers to define their SPV, due facilitate advisers and farmers everyday life (they save time and money, they can work on the fields instead of dealing with complicated calculations).

It needs to be updated because the last update was in 2016.

“The SPV calculator is very useful for the advisors. The calculator helps to establish whether the Farmer meets the tender conditions. It is necessary to type in it what kind of plant he cultivates, what kind of animal the Farmer keeps, and the hectare size, and we obtain the result immediately. It can be treated easily, it gives a result quickly, and it is available from anywhere. It can be recalculated anytime, it is modifiable. **Where it is necessary to count a future value, it can be used very well. It is a great help in our work.**” the Advisor of the Year 2019 wrote me.

Phase I development:

- based on the SPV code table, updating the value sets;
- instead of HUF 275.25 /€, we use the exchange rate published by Eurostat, which is: HUF 296.83583 / €;
- the exchange rate has been corrected in a constant division operation in the code;
- the number of digits that can be entered in the data entry fields has been increased from 6 to 9;
- insert text at the bottom of the page.

Why it is useful to develop a calculator:

The easiest way to illustrate with a calculation example is why the new set of values is more useful for many farmers. Take, for example, 8 ha of wheat:

SPV with 2010 data			SPV with 2013 data		
8 ha	B_1_1_1 Common wheat and spelled	EUR 5217 ST	while	8 ha	B_1_1_1 Common wheat and spelled EUR 6271 ST

It is clear from the example above that it would be much easier in the future to reach the threshold of EUR 6000 for the submission of most investment applications. According to the data of the 2013 SPV, already with 8 ha of wheat would be the 6000 SPV, while with the currently valid values it is only 9.2 ha of wheat. Of course, the data changed differently for each utilization code, but the SPV values increased on average by 23.9%, while the forint depreciated by only 7.8% against the euro. (It is still a good fortune that the deterioration of the forint in 2020 should not be taken as a basis, because it would not look good).

Pursuant to Article 4 of Commission Delegated Regulation (EU) No 1198/2014, the updating of standard production values is to be carried out for all farm structure surveys.

Here are some notes about the calculator:

- This interface is not currently visible to outsiders (only available from an internal network or VPN).
- At the moment, we only have the STE2013 SPV indicators, which are the average of the years 2011-2015. The old calculator used SPV data from 2010, which included data from 2008-2012.
- Eurostat did not request the inclusion of the Christmas tree and other non-Christmas tree plantations separately for the coefficients STE2013, which was one level higher, in the group of other plantations (B_4_6).
- Only a national coefficient was prepared for the chinchilla sector, so that the National Association of Hungarian Chinchilla Breeders calculated the indicator under the professional control of the AKI. Since the calculation of the STE2010 indicators, the Institute has not been contacted with such a request.
- The emperor tree is not yet among the utilization codes and will be in the 2020 table.
- I would like to make the set of values for the calculator public only after this year's tender dumping, so as not to confuse farmers, who still have to use the 2010 SPV data.

A II. planned developments:

Due to funding problems to COVID, many improvements could not be implemented in the first phase. We also planned in the requirement specification that in the future we would like to group the crops according to the utilization code. We would also add a search function and an auxiliary table to calculate the number of animals. Furthermore, by adding an export button, we want to generate an excel that contains every line that was used to calculate. It is expected that in the period of 2021 the phase II improvements can also be realized.

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
<p>The Standard Terme Management Calculator has been developed and developed the NAK 2015 in the first place, and in 2014-2020 it has been implemented in accordance with the Standard Development Program.</p> <p>It is very easy to get used to this product, but to the agricultural management of the local government it is necessary to do so.</p> <p>The calculator of the NAK portal portal (www.nak.hu) is located, it is available at: http://www.nak.hu/ste-kalkulator</p> <p>The calculator can be used to calculate the specific conditions (AKI, NAK, MVH, ME, AM). In addition to the calculator, the calculator is used and the landlord is able to communicate (this is the first time that the calculator is used).</p> <p>In 2015 (Q2), the first round of 2016 (Q3 - September) was published in a fresh, pontoon manner. Nitrogen is formed by nitrogen.</p> <p>A számításhoz tartozó változókat, értékkészleteket és a számítási metodikát ~ 4 event frissíteni kellene együttműködve a szakhatóságokkal, MÁK-kal.</p> <p>In 2020, the latest work has been completed. The fonts, which are completely connected to the new ones, have updated the updated version of the original version of the exhibition.</p> <p>It is possible to use a simple left-hand drive to calculate the calculations.</p>	<p>increase in the number of agricultural sector groups (14 + other instead of 5 (actual))</p> <p>Increase number of characters (from 5 to 9)</p> <p>change the euro exchange rate (the currency of the Member State must be developed by the given Member State, so we only prepare the Hungarian development)</p>

The calculator It has reached 340,000 page views so far! (In 2016, the results of this year were measured, and the number of participants was increased.)	
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1.3 General assessment of adoption

Set milestones and targets about adoption (plan).

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Determining the need for development, seeking the opinion of several consultants	02/2021	key advisors (4 persons)	NAK	These 4 advisors' clients	NAK	
NAK negotiates with the IT development company	03/2021		NAK, IT developer		NAK	
NAK is negotiating with the Hungarian authorities	06/2021		NAK, Hungarian authorities		NAK	
IT developers do the development	06/2021		NAK, IT developer		NAK	
NAK accepts the IT development	10/2021		NAK, IT developer		NAK	
Test run	10/2021	key advisors (4 persons)		These 4 advisors' clients	NAK	
Translation into English	11/2021		NAK		NAK	

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/ negative	impact
Authorities, Agricultural Research Institute,	50-50%	negative /positive	Large

Hungarian State Treasury, Ministry of Agriculture			
Contract with the developer, depend on the Authority	50-50%	negative /positive	Large

1.5 Vision

Presentation of the expected operation of the system, basic changes required to update the calculation:

Changes in value sets for calculation

-Home Page Changes / Grouping Changes

On the opening page of the NAK portal (<https://www.nak.hu/ste-kalkulator>) the groupings would be modified according to the following list (currently it was possible to calculate for 5 groups):

- Animal husbandry
- Berries
- Ornamental plants, nursery, pasture and lawn
- Energy crops
- Forest, wetland
- Cereals
- Mushrooms
- Medicinal and herbs
- Fruit and vineyard
- Legumes
- Industrial plants
- Fodder plants, mixtures
- Hybrid propagating material (instead of the name "Seeds, propagating material")
- Vegetable plants
- Other

For plants, groupings would be possible with a list that opens to a link.

Due to the change in the euro exchange rate, it is necessary to indicate the new value of HUF 296.84 instead of the previous value in the text information, as a result of the development.

-Instead of HUF 275.25 / €, the exchange rate reported by Eurostat should be used for all countries (HUF for Hungary: HUF 296.83583 / €).

-Increase the number of characters in the data entry field

The length of the characters that can be entered in the input fields of the grouping tables should be increased from 6 to 9 characters.

-The number of digits that can be entered in the data entry fields should be increased from 6 to 9.

1.6 Action plan for adoption

Action plan for adoption (made more specific in Action Plan WP5)

Deadlines, milestones: NAK IT, NAK IT coordinator, IT Developer (From CONTRACT signing! *)

Deadline	Milestone	Responsible
No later than the 15th day after the signing of the contract. calendar day	- Logical system design (paper and electronic).	IT Developer
No later than 30 days after the signature of the contract. calendar day	<ul style="list-style-type: none"> - User manual (on paper and electronically); - Operator's manual (on paper and electronically); - Installation and upgrade documentation (paper and electronic) - - Test plan (on paper and electronically); - Test cases (on paper and electronically); - Test reports (on paper and electronically); - - Source code for the trial version of an improved product. 	IT Developer IT Developer IT Developer IT Developer IT Developer IT Developer
No later than 45 days after the signature of the contract. calendar day	<ul style="list-style-type: none"> - Updated Logical System Plan, if there was a change (on paper and electronically); - Updated Installation and Upgrade Documentation (paper and electronic) - Updated manuals (users, operators), if there was a change (on paper and electronically); - Interactive guides; - Source code for the live version of the developed product (on CD). 	IT Developer

Deadlines , milestones: NAK IT, NAK IT coordinator, FS representative

Action	Target group	Target	Timing
<i>Overview of previous SPV versions</i>	NAK IT and NAK IT coordinator,	Define the target group, the available	Sept/2020

	NAK FS representative	resources, the experts, the target group to be involved: advisors and farmers, determine the timeliness	
<i>Collect information – directly through Facebook group, and telephone interview (advisors and farmers too)</i>	NAK coordinator, advisors, farmers	What are the needs for consultants to develop the SPV for help their and farmers’ work?	Nov/2020
Share the collected information, consultation with Informatics	NAK coordinator, NAK IT contact	The aim is to identify precisely the agricultural areas that are important for the SPV after a precise understanding of the needs.	Dec/2021
IT implementation of the defined plus sectors	IT+NAK IT, NAK IT coordination, NAK FS representative	Implementation	Dec/2021
IT specification approval	IT+NAK IT, NAK IT coordination	specification approval	Jan-March/2021
Consultation with the Authorities depend on the <u>CONTRACT signing!</u> * start the action (see 1.7. 1.7Action plan for adoption)	NAK coordinator, Ministry of Agriculture, Hungarian State Treasury	Enable the use of the fresh database as a background	ongoing
Survey	Advisors/Farmers	Possibly additional needs, if any	Sept/Oct 2021
Implementation	IT+NAK IT, NAK IT coordination, NAK-FS representative, advisors, farmers	Mobile app is created and tested.	Nov/Dec 2021

Dissemination	National Consultancy Center by direct mail for advisors (1067 prs) + NAK portal + FB + Young Advisors FB group + NAK newspaper	Article, info letter about the new SPV calculator, trainings and seminars, and implement to the basic training programme for advisors as lesson	Jan-Apr/2022
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1.7 Business case (shown in D6.1)

1.8 Cross Visits

. During the cross-visits we can present the use of the SPV calculator, we can explain its logic, we can present it on a farm with the help of consultants. We would like know a Spanish/Irish/Slovenian/Portuguese application.

Training, fostering adaption of DATS

. In the National Advisor/Consultancy Center (functioning in the NAK) there are Basic Training study-materials for advisors, and one of the subjects is the “Knowledge of IT systems”. The advisors in this material can study about using the SPV.

The study-materials online, are available for the advisors to learn and to pass on the basic exam held at the National Consultancy Center (Module programme), which is an accredited/official examination Center in Hungary.

The knowledge of the SPV calculator is integrated in the “IT systems” subject, in the framework of e-learning.

7.17 Naturland

NATURLAND – Bundling and optimization of communication channels in advising farmers

1.1 Identification of the needs/challenges advisors face

Naturland Beratung, the advisory service of Naturland, faces the challenge of using too many ways of contacting their farmers. This challenge is mainly driven by two issues. A traditional way of contact (phone, fax, email, site visits) including a printed magazine sent out every two months. On the other hand, social media including messengers such as WhatsApp and the homepage are getting more popular. Essential for the majority of advisors and farmers are still face-to-face communication including site visits. In return site, visits can be time-consuming, expensive (driving time and costs) or -e.g., in 2020 the year of a pandemic-complex, undesired or even forbidden by law.

Therefore both, advisors and farmers need one channel to communicate directly, quickly and safely. Neither farmer nor advisors should have more work but gain a benefit of a bundled and specific information asked and delivered just in time. The quality and the quantity of information should not be lowered but overlap and doubling should be avoided. The vision could be a separate communication platform suitable on a (mobile) device that is already in use day by day like a smartphone.

1.2 Overview of existing communication channels from Naturland

Communication channels detailed in the Naturland advisory team	
type	details
Printed magazine “Naturland Nachrichten”	Very good information, editorial work but slow and less connected to the homepage
BioTOPP	Wide dissemination, detailed information
Naturland homepage	Information hard to find, due to the different departments, but theoretically a lot of information there
Newsletter	Can be overlooked in a full mailbox, much information will not be read instantly
Phone	Availability not always given
Social Media	Allows direct and fast communication and action, not

	enduring, cannot transfer detailed information constantly
Site visits	Transferring a lot of information, but time-consuming, car required and difficult depending on the covid-19 situation

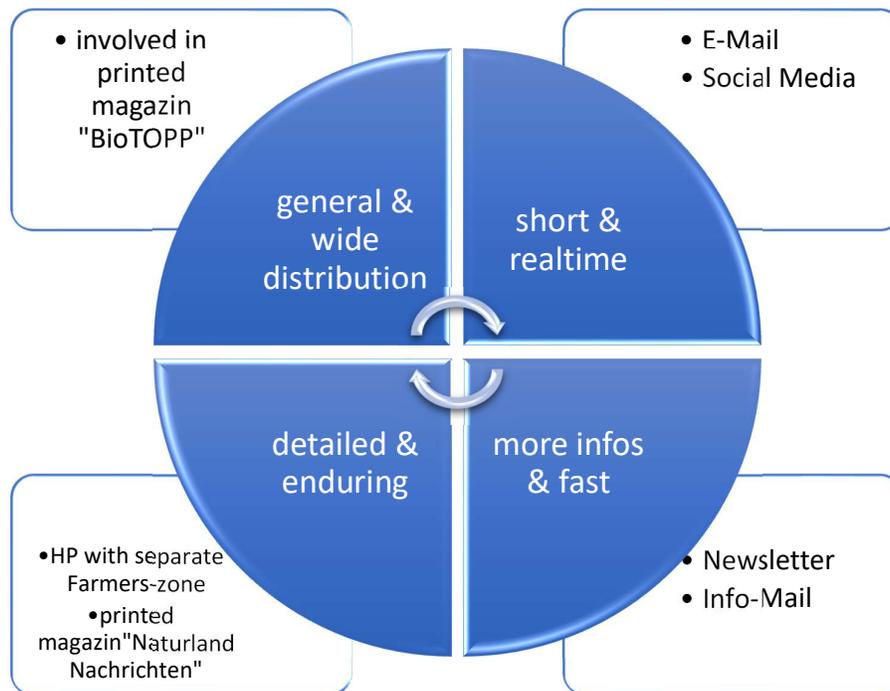


Figure 1: Different types of communication channels from Naturland

The Naturland Beratung team is communicating via different channels internal and external. Digital communication has increased over the last 10 to 15 years, whilst keeping traditional ways of communication. Nevertheless, every channel has its appropriate function as described in Figure 1, but the challenge is still to align information properly, on the input and output side and give the same amount of information. Naturland Beratung is looking forward to bundling all actions in one tool, to take whole advantage of well-elaborated information in a clean type of communication, that fulfils all aspects of data security and privacy. An additional point in favour would be: through the use of suitable digital tools an exchange over greater distances can be realised. For example, a farmer from northern Germany can easily discuss different topics not only with neighbours but also with farmers from southern Germany. That'll be a big advantage for everyone!

1.3 General assessment of adoption

Assessment general:

Milestone	Date	Users advisors	Appreciation	Use at farms	Appreciation	remarks
Test done	Dec 20	35	7/10	0	8/10	
Intro done - Review of first steps	Mar 21	50	8/10	20	8/10	
Review of used functions	Apr 21	15	9/10	30	9/10	
Addition of changes/ remarks	Sep 21	5	7/10	5	7/10	
2 nd review process	Dec 21	50	8/10	50	8/10	
Wider range	22	5	7/10	10	9/10	Especially for farms with a public target group

1.4 Factors influencing the current status of DATS in the UC

The group of Naturland members (the farmers) is quite diverse. The farms in the North and East of Germany are bigger compared to those in the south. Information exchange is quite different, the main reason could be the legal form of the farms. The advisors are diverse as well, actually used digital communication solutions such as homepage and e-mail are common for everybody. But there is still a lack of adoption, interaction and performance.

New technologies and ways of communication are struggling many times for acceptance, especially with an older generation of farmers and advisors, that are used to their manner of communication.

Factors	Chance to happen	Positive/negative	impact
Young farmers and advisors using new technologies	90%	++	100%
older farmers and advisors using new technologies	35%	--	25%
Data safety and reliability	100%	+	50%

Changing user habit in use of communication channel	60%	-	50%
Alignment of all communication channels given by the advisory	75%	++	75%

1.5 Vision

Focus points:

- Good assistance and management of information for advisory
- Farmers get the information they want when they need it. They can select how much information they want to have instantly, later or not given. Farmers should understand a new DATS as assistance not as extra work, important not to overstrain them.
- Farmers should use the messaging function for communication among each other
- Advisors know exactly who has received which information at which time. Easy to make a quick response to a particular question.
- Fulfilling all terms of data privacy laws

1.6 Action plan for adoption

Action plan for adoption (made more specific in Action Plan WP5)

Action	Target group	Target	Timing
Adoption to special needs	Management	Adoption	asap
Strategic collaboration with all of the information supplier	management	inclusion	Jan 21
Set up a plan for sharing information	Few persons inside of the team	editorial planning	Jan 21
Evaluation of participants	Farmers	Overview	March 21
Satisfaction	Farmers and advisors	Quality of information	March 21
Lean and clean organisation	Team	Efficiency	March 21
Survey	Farmers	Additional needs	Jun 21
Add on possible content/ functions	Farmers and advisors	Extra value	Sep 21
Assistance for the interaction of farmers and consumers	Public (farmers) customer, consumer)	Exchange farmer - consumer	2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Naturland would like to organise cross visits to show and compare information- and communication-sharing strategy and systems with other rural advisory companies.

Main subjects would be internal and external ways of communication concerning the given quality, quantity and how long the responding times are. Another important issue is data privacy and security.

Prefers to visit any comparable UC. We prefer countries with similar farm and advisory structures.

If no face-to-face cross visits are possible, we are open for online-conferences.

1.9 Training, fostering adaption of DATS

We will organise different training sessions for advisors to use the DATS correctly in communication and giving information to the target group. Preferably, these will take place in 2021 so that the content can be appropriately prepared and communicated to the target group and adjustment in training-methods and -subjects can be made. This should ensure the smoothest implementation of the DATS as possible.

7.18 APCA

APCA/RCOA;

Enrich the services of the platform Mes Parcelles

1.1 Identification of the needs/ challenges advisors face

The need to steer farms (farmers and advisors) optimally from objective data collected from personal sensor (own by farmers) or shared sensor (community of sensor owner) and Decision Support Tool (DST).

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Before the DATS farmers have the plots data on paper and lose it or forget where they put the paper or find only a part of the data so they have trouble for CAP declaration	It's important to centralize data and not lose it. The computer could be a good idea to do it.
Fourteen years ago, we had the first centralized farmers data to help them with CAP declaration. The farm advisors can use the data to help farmers	This data is helpful, maybe we can develop it to give more help to farmers and advisers.
In 2007, the DATS Mes Parcelles was created for farmers to help them with CAP application, plot management and cartography.	Farmers like these DATS because they can have access to their farm data easily and manage their plot efficiently.
Today Mes Parcelles is a toll for steering farm with a lot a diverse service	Mes Parcelles is one of the three main FMIS (Farm Management Information System) with 40 000 users

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Who approves	Use at farms	Who approves	remarks
Technical analysis of services and connections with Mes Parcelles	May 2021					
Operational connections of a new service	September 2021					
Ownership and deployment plan	December 2021					

1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/ negative	impact
Farmers no longer trust technology	60%	Positive	Large
Make more informed decisions (either alone or with the help of the advisor)	60%	Positive	Large
Increase collection of operational info on farm	90%	Positive	Medium

1.5 Vision

Agriculture in the throes of change in three points:

- Climate change
- Agro-ecological transition
- Reorganisation of sectors in the light of consumer expectations and market globalization

The service platform Mes Parcelles makes it possible to support farmers in these transitions through the services offered and support from advisors.

We want Mes Parcelles to become the most complete platform (offering many services and a marketplace)

1.6 Action plan for adoption

Action	Target group	Target	Timing
Communication through the information portal	Advisors and farmers	All	2021
Testing services	Advisors and farmers	20	October 2021
Webinar	Advisors and farmers	100	October 2021
Training of advisors	Advisors	40	November 2021

1.7 Business case (shown in D6.1)

1.8 Cross Visits

Organisation of a cross-visit to present the platform to project partners.

1.9 Training, fostering adaption of DATS

Two training courses: one for farmers (Decitrait) and one for advisors (Mes Sat'Images and Decitrait)

Organisation of Advisor Webinar

7.19 LKO

LKO / Advisory services for the digital farm

1.1 Identification of the needs/challenges advisors face

Historically farmers and advisors foster a close relationship for farm-related decisions. Thus, over the years, farmers have come to expect high-quality personalized on-site advice. However, the increasing complexity and co-dependency of technology, expert knowledge and regulations require more and more effort from advisors in order to be able to keep a high quality standard and timeliness of advisory services provided. Task automation as well as efficiency gains using digital tools may enable advisors to use their time more efficiently by freeing them from routine or non-productive activities.

To this end, the user case at hand has identified two challenging areas for advisors:

Challenge 1: Maintain a high level of customer service when in-person interaction is restricted or economically not feasible.

The COVID-19 crisis has dramatically exposed the service provision barriers, which arise when in-person interaction between farmer and advisor is not possible. However, other everyday scenarios like geographical distance to available expertise or the need for repeat short meetings hamper the ability of advisory services to provide satisfactory services. A high-quality automation may retain customer satisfaction, while freeing up advisor time. In addition, in Austria, with its numerous small farms, which are scattered at relative distance from one another, cutting travel time of advisors enables a higher productivity.

Thus, a first step towards a solution is to automate initial customer contact and knowledge retrieval of generic questions and search. To this end, we aim to pilot an AI-driven chatbot for the advisory services website. Thematically the chatbot will focus on the expert topics addressed in Challenge 2 and Challenge 3.

Challenge 2: Increase advisor service quality by enabling farmers to develop more self-reliance using digital tools with low entry barriers/learning curves, while at the same time improving animal health and digital record keeping proving compliance with regulatory/legal measures

Animal, i.e., livestock, health is dependent on clean air free of noxious substances. A real-life monitoring tool, which also allows keeping track of the data measurements digitally as a compliance record would be helpful for farmers in their daily activity.

1.2 Future in the context of history

Stages in LKO's User Case and lessons learned

History	Key Lessons learnt
Challenge 1: Customer satisfaction through automation	
Collection of articles which are searchable through an database index function	Set up interactive question and answer interaction to help identify the relevant information item
Challenge 2: Animal health and compliance monitoring in livestock buildings	
Due to improper ventilation – and monitoring of the same – quicker propagation of disease among livestock.	Set-up a digital monitoring system.

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date	Users/ advisors	Approval	Use at farms	Approval	Remarks
First test air quality for livestock buildings DATS	April 2021	1	6/10	1	6/10	
First AI-based chatbot operational	June 2021	5	6/10	5	6/10	
Second test air quality for livestock buildings DATS	October 2021	5	8/10	10	8/10	
Updated AI-based chatbot operational	December 2021	10	8/10	15	8/10	

1.4 Factors influencing the current status of DATS in the UC

If DATS are successful in the UC at hand will depend on

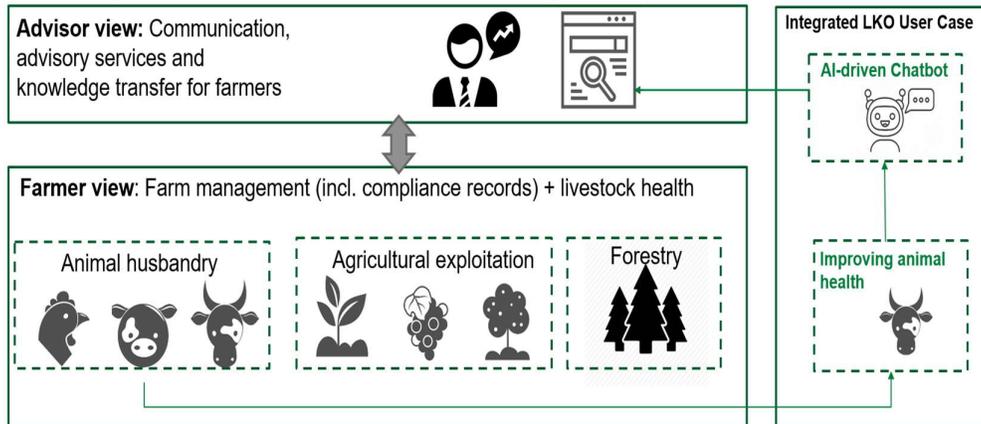
- Their availability in German language
- How well the technology solution fits practice needs
- How comfortable advisors feel using the technology (respectively how user friendly the new technology is)
- How comfortable farmers feel using the new technology
- How flexible and “intelligent” automated response paths are in relation to customer expectations
- How much automated paths reduce advisor work

- How well automation solutions are communicated to advisors, so that they do not feel threatened by process automation
- Good network connectivity and interoperability of existing software solutions/operating systems on farms (or mobile devices) with DATS.

	Chance to happen	Positive/negative	impact
Advisors less willing to have on-farm visits	60%	+	75%
Farmers become more confident in using technology	100%	+	100%
Advisors cost cutting and reducing spending as off recession	50%	-/+	50%

1.5 Vision

Digital aides – either as tools or as services – integrating all aspects of farm work facilitate a better farm performance and better life-quality for farmers. Support through digital tools as well as breaking clear of routine, non-value adding activities enables advisors to perform better expert services for the farmers. Through the support of DATS, advisors have a better ability to exchange knowledge with their farmers.



Integrating the knowledge gained from the implementation of DATS for animal health into the automated paths of the advisory services website for knowledge provision will enable a better information design in these areas and thus provide information that is more valuable for farmers. Automated learning in the background, based on questions posed, enables a continuous improvement of automated service provision. Crosschecking DATS functionality with questions

posed on the website will enable a better identification of farmers needs and thus subsequently a more timely advisory service development.

1.6 Action plan for adoption

From the learning history, we will identify and enhance the most useful and beneficial aspects of DATS to suit the needs of farm advisors and provide options that work best for them.

Action	Target group	Target	Timing
Collaboration with advisors interested in Challenge 2	Selected advisors	2 persons	December 2020
Operational planning of adoption	Selected advisors/farmers	4 persons	January 2021
First round of DATS implementation (Challenge 2)	Selected advisors/farmers	4 persons	April 2021
Evaluation and customizing (Challenge 2)	Project staff, external partners	4 persons	June 2021
First round of DATS implementation (Challenge 1)	Project staff, external partners	2 persons	June 2021
Second round of DATS implementation (all challenges)	Selected advisors/farmers	20 persons	December 2021
Evaluation and adoption of DATS (all challenges)	Farmers and advisors	30 persons	June 2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

During the User Case implementation, we plan to organise three cross-visits. Advisors and project partners will join – either in person or online, depending on the public health situation – the meeting to exchange experiences. These will include the problems faced in practices, solutions found and open issues, sharing of good practices and approaches as well as how DATS have help (or not) in the provision of solutions. They will link them with T6.1. “Business case, vision and roadmap”.

1.9 Training, fostering adaption of DATS

Initial pilot users – advisors and farmers – will be trained in the proper usage of the DATS, to enable them to use the tools properly. Once the pilots are



completed, we will run training sessions – using webinar/farminar formats - with advisors and farmers aiming to foster the adoption of the DATS on a large scale.

7.20 LAAS

LAAS – Lithuanian Agricultural Advisory Service/ Digital communication and better access to digital services and information for Advisors and Farmers.

1.1 Identification of the needs/ challenges advisors face

Present-day farm operations are becoming more and more business-oriented. Farming is more than just producing crops, growing livestock and etc. It requires farmers and landowners to analyzed profitability, tax issues and farm’s activities to make valuable decisions in case to keep a farm productive, sustainable, resistant and profitable. Farmers and advisors share common desire to solve daily farming problems as fast as possible in order to achieve higher efficiency in a farm. To resolve this problem LAAS specialists would like to create digital instrument – mobile app for the existing programme e. GEBA. This app will give possibility to improve collaboration between farmers and advisors in such way:

- Farmers do not need to visit an advisory service office for consultancy, or search needed information in computer (home). All needed information between the farmers and advisors can be operatively exchange using mobile app, at the right time.
- The advisors do not need go in different farms for face-to-face consultancy.
- The farmers can get an agronomics’ consultation according to current needs in simpler way.
- Remote and safe communication (important issue in COVID-19 context).

About programme: e.GEBA is a farm management programme developed after analysis of foreign countries tools, recommendations of Lithuanian scientists and the practical work experience of the specialists of the Lithuanian Agricultural Advisory Service (LAAS). The programme can be used by both: service advisors and farmers.

Advantages of the programme:

- The programme consists of four modules: Animal Husbandry, Economy, Accounting, and Plant Production.
- Data automatically exchange among modules (saves time for advisors and farmers and reduces likelihood of mistakes).
- Data are available in one place (helps to identify main problems and take relevant actions).

1.2 Learning history or Future in the context of history

History	Key Lessons learnt
Consultants (advisors) and farmers have been using the e.GEBA programme for 10 years.	Farmers and consultants (advisors) need more motivation to use this programme.
Still some data are presented in paper report forms, like: farm economic activities analysis, fixation and planning.	For farmers and consultants (advisors) data collection must be simple, digital and on time.
Farmers can analyze the data and results of their farm activities in paper report forms or by logging in to the WEB browser (only on the computer screen).	A simpler way to analyze farm data or indicators is using mobile app. This would facilitate the farm decision-making process.

1.3 General assessment of adoption

Set milestones and targets about adoption.

Milestone	Date (deadline)	Users/ advisors	Who approves	Use at farms	Who approves	remarks
1. Creating a mobile app structure.	06-2021	7 advisory service (AS) representatives 1 IT specialist (from LAAS)	3 AS representatives			
2. Mobile app creation: 1 step: in app created a customer data sector, where customer can attached various formats files.	09-2021	7 advisory service (AS) representatives 1 IT specialist (from LAAS)	3 AS representatives			
2 step: created an interface to the customer's dashboard	12-2021	7 advisory service (AS) representatives 1 IT specialist (from LAAS)	3 AS representatives			
Final tested version	03-2022	20 advisory service (AS) representatives	15 AS representatives 10 farmers			

		20 farmers 1 IT specialist (from LAAS)				
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1.4 Factors influencing the current status of DATS in the UC

Factors	Chance to happen	Positive/negative	Impact
Due to workload, tasks were not completed on time	30 %	negative	Middle
Delayed integration of information from / into different databases	30%	negative	Large
COVID-19 increase the demand of contactless data submission.	60 %	positive	Large

1.5 Vision

Time is very valuable. We must use it as productively as we can. Mobile app is one of the ways to get fast and operative information for making productive, sustainable and profitable decisions for farmers in farm management solutions. By this project in advisor's and farmer's phone will be created an easy-to-use mobile app, based on the interface with the farmer's farm management data application (dashboard). In this app, farmers will be able quickly and expeditiously provide the necessary information for the advisors that helps to receive essential consultation on time. They will also be able to review the results of their farm activities, analyze them and make important decisions for the farm activities in due course.

1.6 Action plan for adoption

Action	Target group	Target	Timing
INFORMATION COLLECTION <i>(working group)</i>	IT and agronomy specialists, farmers, process administrators	Define all needed information for process description	03-2021

ACTION PLAN <i>(to develop and implement the idea)</i>	Farmers, advisors, specialist	IT	Procedure plan with concrete tasks, time table and responsible persons.	04-2021
IMPLEMENTATION (including all development and testing works)	Farmers, advisors, specialist	IT	Mobile app is created and tested.	01-2022
DISSEMINATION	Advisors		App will be presented in farm days, seminars, workshops and etc.	05-2022

1.7 Business case (shown in D6.1)

1.8 Cross Visits

During the implementation of the User Case, it is planned to organize the two cross-visits. The advisors and project partners will visit developers from FairShare platform, who's created similar DATS like LAAS planning to develop. The goals of cross-visits are to adopt the experience and solutions of similar app which solves daily farming problems and have a holistic approach in farm management system. If no face-to-face cross visits are possible, we are open for online-conferences.

1.9 Training, fostering adaption of DATS

Mobile app will be created like easy-to-use DATS. Before using the tool extensively, first of all advisors will be trained in the proper usage of the DAT. After what, will be organized training for farmers.

8 ANNEX II

Presentation of the Q&A session on the 28th of January 2021

Speakers:

Peter Paree (ZLTO), Evi Arachoviti (I4Agri), Franz Hobmeier (Naturland)

A dark green rectangular slide with white and red text. At the top, it says 'Welcome!' in red. Below that, 'FAIRSHARE Q&A session' and '28-1-2021' are written in white. An 'Agenda:' section follows with a bulleted list of topics. At the bottom, a red line of text states 'New and last Deadline: 03rd February 2021: complete description'. A hand holding a smartphone is visible in the background.

Welcome!

FAIRSHARE Q&A session
28-1-2021

Agenda:

- Explanation: context of UC, next steps/timetable
- Finance of the BC:
 - Available PMs; other costs, how to use them
 - Extra budget
- Answering all questions known so far
- Further explanation of Business Case, exampleNaturland BC
- Open question Tour de Table

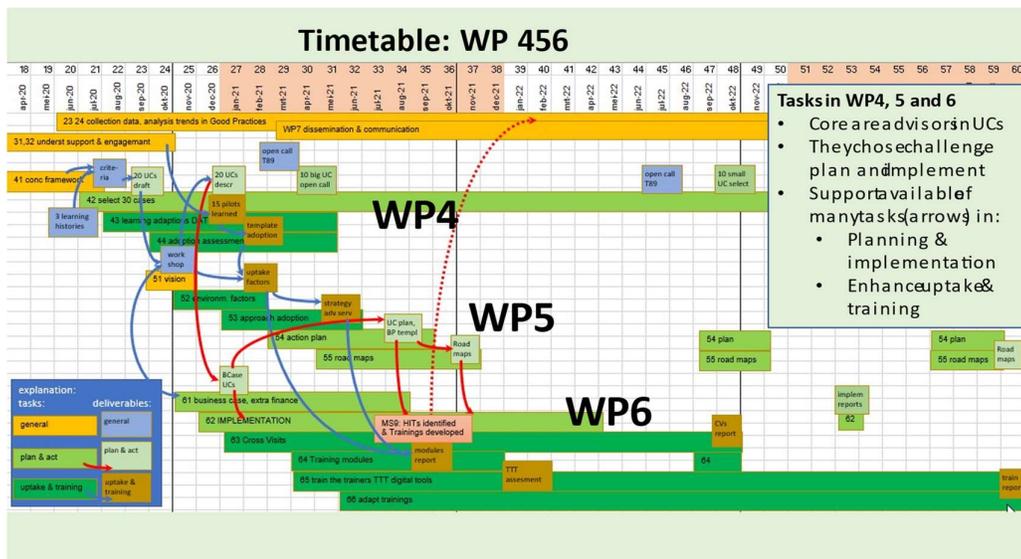
New and last Deadline: 03rd February 2021: complete description

30 Ucs: 20 with partners;
+10 after open call
+10 smaller Ucs, address
questions on HITs & trainings

WP4: select
WP5: plan
WP6: Support, monitor, train

Context

- Use Case is an **advisors' challenge** that is solved, **adopting** (=using) and **adapting** (= translate, not develop) one or more **DATS** (available or added to the inventory)
- Process started last summer (integrating UC BC, etc)
- Deliverable: descriptions **end of February 2021** (postponed)
so: **Deadline: 03rd February 2021: complete description**
- The work is not finished, but it starts **now**



Finance

Personnel cost

- Each UC has 9PM * 5500 Euro = **49500 Euro**
 - So low PM rate gives you more PMs available
 - Basic division: WP4: 2PM; WP5: 2PM; WP6: 5PM

Other costs on project level:

- **Travel & Subsistence: for your own employees**
- **Other Goods & Services:**
 - Cross Visits: receive visitors
 - Training: travel & subsistence for people **outside your organisation**
 - Translations (often 5 * 1000 Euro) for (language) **adaption** of DATS

Basic div:
 WP4: 2PM;
 WP5: 2PM;
WP6: 5PM
 TOT: 9PM

Questions/Answers so far, financial

Basic div:
WP4: 2PM;
WP5: 2PM;
WP6: 5PM
TOT: 9PM

How to describe costs:

- PMs: 49500 Euro /your PM-rate * basic division
- Look at budget for **Trainings**, think how to contribute to organisation
- Look at budget for **Cross Visits**, think how to contribute to organisation
- No details needed! We come with central proposals later

Adaption

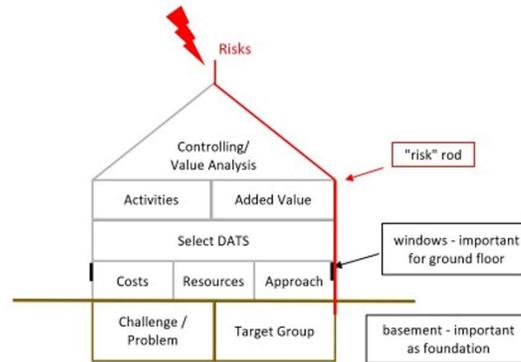
- Where do you need translations in project?
- You may use translation budget for (language) **adaption** of DATS

No change of PM budget to development of DATS (subcontracting)

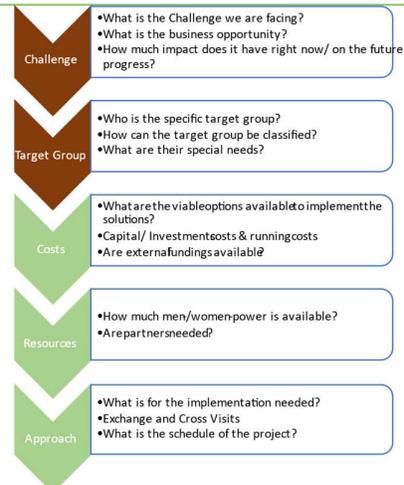
Business Case

- General overview
- Case of Naturland

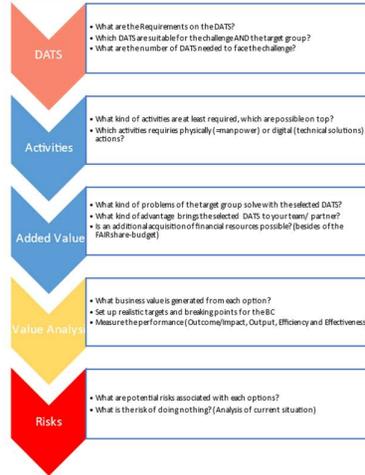
Business Case: House



Business Case: Flow Chart



Business Case: Flow Chart



Questions/Answers

Tour de Table



Wrap Up

FAIRSHARE Q&A 28-1-2021

- Context of UC, next steps/timetable
- Finance of the BC:
- Explanation of Business Case
- Open question Tour de Table

**New and last Deadline:
03rd February 2021:
complete description**

Thank you!



Zuidelijke Land en Tuinbouworganisatie
Peter Pree

peter.pree@zto.nl

9 ANNEX III

Selection criteria for the subcontracted UCs

Teagasc in conjunction with the regional hub leads (LAAS, SEASN, and ZLTO) will coordinate the open competition procurement process for the 10 external User Cases. To ensure that all applicants follow the same process Teagasc is designated the “Contracting Authority” and invites tenders for the call from groups of advisors (“Tenderers”) for the provision of a User Case. Teagasc will use the eTenders platform where a Request for Tender (RfT) document and associated Response Document will be used by applicants to submit their proposals. As Teagasc is overseeing the eTenders process it is governed by and construed in accordance with the laws of Ireland where the courts of Ireland have exclusive jurisdiction to hear and determine any disputes arising.

The public procurement competition will be divided into 4 lots (each a “Lot”) as described below. Each Lot will result in a separate contract.

Lot 1. West Europe - France, Ireland, UK, Spain, Portugal - 1 large User Case and 2 smaller User Cases which will be co-ordinated and overseen by Teagasc.

Lot 2. North East Europe -Lithuania, Latvia, Finland, Denmark, Poland, Estonia, Norway - 7 large User Cases and 3 small User Cases which will be co-ordinated and overseen by LAAS (VIESOJI ISTAIGA LIETUVOS ZEMES UKIO KONSULTAVIMO TARNYBA).

Lot 3. South East Europe - Croatia, Serbia, Slovenia, Bulgaria, Hungary, Kosovo, Macedonia, Montenegro, Romania, Greece -1 large User Case and 3 smaller User Cases which will be co-ordinated and overseen by SEASN (MREZA SAVJETODAVNIH SLUZBI JUGOISTOCNE EUROPE).

Lot 4. Central Europe - Germany, Italy, Switzerland, Belgium, Netherlands, Check - Rep, Slovakia, Austria -1 large User Case and 2 smaller User Cases which will be co-ordinated and overseen by ZTLO (ZUIDELIJKE LAND- EN TUINBOUWORGANISATIE VERENIGING).

Once applications are received Teagasc will assign each to one of the four regional hub leads depending on the applicant’s geographical location. Each regional hub leader will then select the successful User Cases by adhering to their own organisational governance protocols and by evaluating each applicant’s Response Document based on the criteria outlined in table below. The FAIRshare project members have complete authority to decipher which applicants should attain funding.

Table 2: Selection criteria for the subcontracted UCs

Criterion	Components	Marks
Objectives of the proposal targeted to practical outcomes	User Case Description	25
Composition of the technical capacity of the advisors who will be involved in the implementation of the proposal	Expertise and Excellence	20
Brief overview of work plan and proposed actions	Project Planning	10
Value for Money	Value for Money and Added Value	20
Relevance and Impact	Clear relevance to the aims and objectives of the FAIRshare project	5
Sector	Does the User Case represent an appropriate sector that enables the diversity of the FAIRshare project	5
Geographical Location	Is the User Case located in a region that enables the diversity of the FAIRshare project	10
Supplementation of project funding	Will the User Case funding be supplemented with funding from the host organisation (<€36k = 1 mark, €36-54k = 2 marks, €54-72k = 3 marks, €72-90k = 4 marks, >€90k = 5 marks)	5