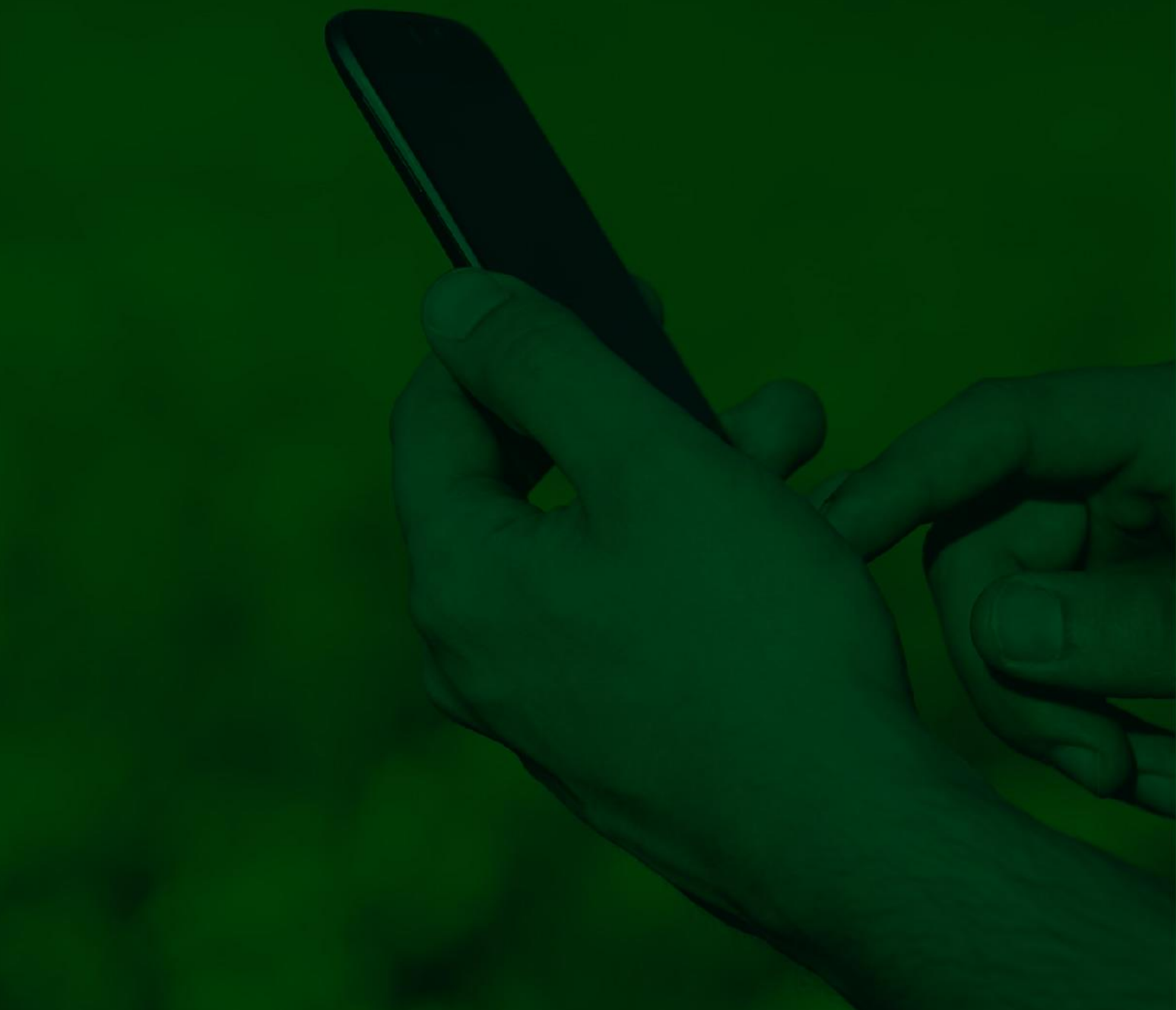
FAIRshare

DIGITAL TOOLS FOR FARM ADVISORS



Deliverable D6.4
Report on Training Modules
2nd year

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Technical References

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Content

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1. Acronyms

DATS	Digital Advisory Tools and Services
DSS	Decision Support Systems
UC	User Case
UC-BC	User Case – Business Case
WP	Work Package

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2. Introduction

The general aim of FAIRshare is to ensure the effective use of digital advisory tools and services (DATS) among farm advisors to support a productive and sustainable agriculture.

In addition to providing an inventory of DATS (Work Package 1) and classification of high impact advisory tools (D3.5), within WP6, we focus on the expansion of the use of proven high impact digital technologies among independent advisers within and between regions, member states of EU and internationally. Together with the WP1 and WP4, WP6 aims to identify resource materials of trainings and to develop learning competences for advisors to support adaption of DATS.

Task 6.4 can be considered as being part of the Living Lab approach explained in the conceptual framework (D4.1.). The work done in T6.4. aims to serve as input for a more elaborate process in WP6. Specifically, it seeks to **develop and combine existing modules to targeted training, fostering adaption of digital tools by different advisory disciplines within advisory organisations and networks**.

This document starts with a brief summary of the background of the current task, such as needs, and general problems of advisors and farmers related to digital technologies. This part also gives some insight into how the Covid-19 situation has impacted the subject of our work. It then presents the relevant literature sources that our activities are based on. This is followed by information from prior FAIRshare Tasks and Deliverables which shaped the current task. Subsequently, the document then explains the methodology applied to different activities of this task. Finally, the results section provides descriptions of each activity and explores in detail the lessons learnt. It is structured into five main parts, each representing an activity.

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3. Background

It has been proven that the use of digital tools and advanced technologies in the agriculture can improve food production and environmental sustainability. However, the introduction to digital tools is often arduous because farmers feel lost among the abundance of digital tools on the market. Moreover, advisors do not feel confident to guide them, especially if they do not have much experience with digital tools. More often than not, both farmers and advisers face difficulties in choosing digital tools and using them for the first time. There is a huge need to ease the transition to digital farming for both of our targeted publics. For this reason, we have compiled an inventory of existing training models upon the needs identified in user and business cases. Because lack of digital literacy is one of the barriers to effective use of DATS, the inventory contains both general and DATS-specific trainings. Training modules are uploaded on the FAIRshare website to make it as visible and accessible as possible for the potential users.

Most recently, the COVID-19 pandemic has challenged agricultural advisory services around the world to rapidly innovate and adopt digital and remote tools to enable them to continue supporting farmers. Digitalization became the main tool to overcome the consequences of the pandemic and to continue consulting activities and day to day work practices. As the digital revolution accelerates, attention needs to be focused upon ensuring that digital training keeps pace with the development of DATS. The pandemic has also increased the number of online trainings available on the market. Many trainings used to be designed only for face-to-face usage but the pandemic has changed this and many face-to-face trainings have now been adapted for online training as well. For example, the joint training and support service of the Chambers of Agriculture network in France “Resolia” has adapted several of its courses for digital use. In the spring of 2020, between 50% and 75% of the training courses have been converted, in part or in full, to distance learning.

3.1. Relevant literature sources

Databases of scientific publications such as Web of Science and Elsevier contain many articles on the acceptance of IT or digital technologies. Our work is based on the Unified Theory of Acceptance and Use of Technology model (UTAUT), developed by Venkatesh et al. (2003). This theory, explained in detail in

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D4.3., proposes that there are four constructs that are direct determinants of user acceptance and usage behavior including: performance expectancy, effort expectancy, social influence and facilitating conditions (Figure 1).

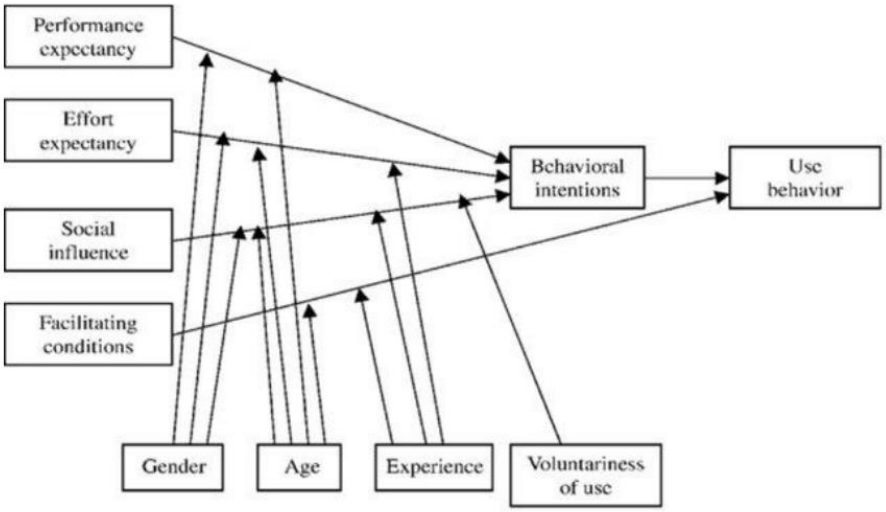

Figure 1 UTAUT research model (Venkatesh et al., 2003)

Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. *Effort expectancy* is defined as the degree of ease associated with the use of the system. *Social influence* is defined as the degree to which an individual perceives that important others believe he or she should use the new system while *Facilitating conditions* are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system. These stand alongside four moderators, namely *gender, age, experience* and *voluntariness of use*.

In the field of agriculture, Rose et al. (2016) have found that some particular factors affect uptake of decision support systems (DSS) by farmers and advisors: performance, ease of use, peer recommendation, trust, cost, habit, relevance to user and farmer/ advisor compatibility (Figure 2). Alongside these, they have also identified a number of modifying factors (i.e. age, scale of business, farming type, IT education), one enabling factor (i.e. facilitating conditions) and two driving factors (i.e. compliance (legislation), level of marketing). As can be seen in the Figure 2, the modifying factor *IT education* is affecting some core factors (red arrows). The same applies to the task 6.4., fostering adaption of digital tools through targeted training has a direct impact on core factors *performance, ease of use, trust and habit*.

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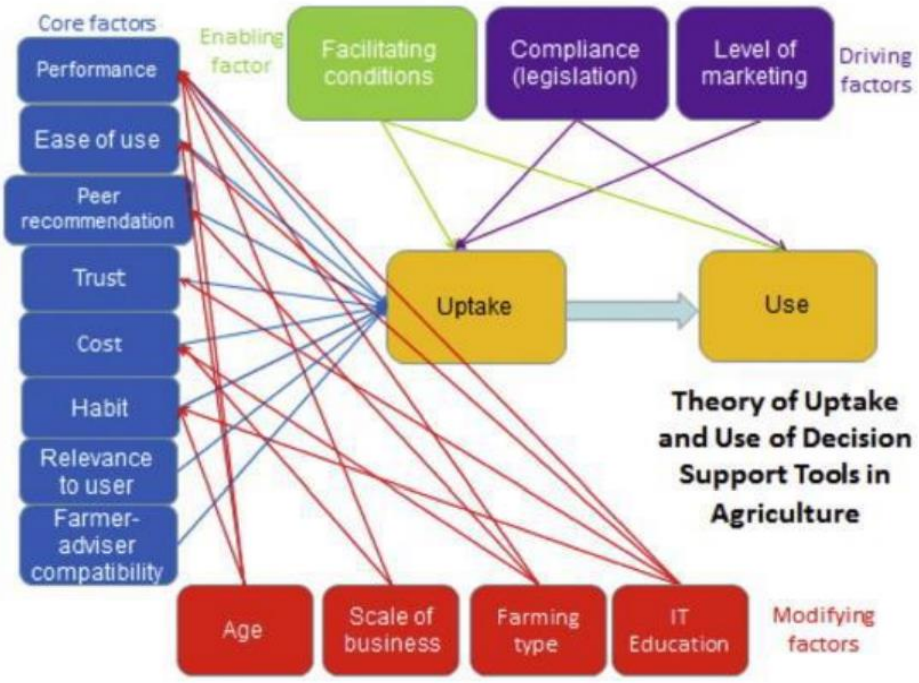

Figure 2 Theory of uptake and use of DTs in agriculture (Rose et al. 2016)

3.2. Link with other Tasks and Deliverables in FAIRshare

The first deliverable with a close link with the task 6.4 is **Deliverable 3.1. – Factors influencing Adoption of Digital Agriculture Tech by Farmers and Advisors**. Its' objective is to outline the main barriers, incentives, and engagement factors in the development and use of DATS. Supported with scientific literature, it exposes findings from workshops with partners conducted during the consortium meeting in Dublin and Athens, and lists factors influencing the use of digital tools. The top 10 barriers to the use of Digital tools for both farmers and advisors include challenges such as "lack of digital skills, e-competences and lack of professional training/ advice/ coaching"; "privacy concerns related to data sharing and ownership"; "lack of promotion and awareness of digital infrastructures"; "information overloaded" (SCAR-AKIS, 2019). All these barriers can be overcome through digital training and raising awareness of data management.

Secondly, **Deliverable 3.3 – Contextual advocacy and animation approaches** - identifies barriers for the uptake of digital tools and technologies in specific geographic areas (Western Europe, Central Europe, South-Eastern Europe and North-Eastern Europe) and links them to the influencing factors determined by both Venkatesh et al. (2003) and Rose et al. (2016). Out of 27 barriers, 10 barriers listed below are due to a lack of training (Table 1).

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Table 1 Barriers to uptake of tools & technologies identified in D3.3

Barriers	W EU	C EU	S-E EU	N-E EU	Linked to factors as determined by Rose et al. (2016) & Venkatesh et al. (2003)	How can training modules overcome this barrier?
Lack of independent advisors on DATS				x	Farmer-advisors compatibility/ Facilitating conditions	Train the trainer = train advisors to use DATS
Poor skills/ lack of skills/ lack of training to use digital tools (both farmers and advisors)	x	x	x	x	IT Education/ Experience	Train advisors and farmers to use DATS
Language		x	x		Ease of use / Facilitating conditions	Training helps to identify tools that are available in the mother tongue (DATS inventory)
Output not easy to understand/ no straightforward data presentation		x	x		Trust ease of use/ effort expectancy	Trainings will provide the logic and the experience of how DATS work
Unknown tools or technologies/ unawareness		x	x		Level of marketing	Training to search for necessary tools (DATS inventory)
Value/ benefit not clearly visible		x	x	x	Relevance to user/ Performance expectancy	Trainings clearly communicate benefits of using DATS
Data collection and security too complex	x	x	x		Ease of use/ Effort expectancy	Data protection trainings
Not user friendly (+ consider profile/ age group)	x	x			Ease of use/ Effort expectancy	Profile/age-specific training
Too much work for data input (in different tools, same data)	x	x			Ease of use/ Effort expectancy	Training to work effectively with DATS
Tools look complex to start with			x		Ease of use/ Effort expectancy	Trainings for a smooth start

Thirdly, **Deliverable 4.3 – Learning from Ongoing Pilot Adoptions of DATS** – identifies the various influencing factors (e.g. economic, social, demographic, technical) that impact the success for 1-2 pilot DATS for at least 15

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out of the large UCs. In the overview of the main positive and negative experiences, identified by interviewees based on their experiences with pilot DATS, the barriers are divided into three levels: institutional/ organization level; individual level; technological/ DATS level (Table 2).

Table 2 Overview of the main barriers of using DATS (D4.3)

	Barriers	**Solutions**
Institutional	1. Government (e.g. bureaucracy) 2. Poor connectivity 3. Poor cooperation between different departments 4. Lack of organizational resources	
Individual level	1. Ageing farmer/ advisor population 2. End users are reluctant or sceptic 3. Inherent lack of motivation 4. Users lack right competencies or capabilities to use tool 5. Tool difficult to use 6. Not enough time to learn and work with new DATS 7. Advisors feel threatened by DATS 8. Affect advisor-farmer relationship negatively 9. Farmers and/ or advisors feel in competition with tool	1., 2., 3., 7., 8., 9.: The added value of DATS needs to be clearly communicated to advisors and farmers so they feel motivated and not threatened to use them. 4., 5., 6.: Targeted training takes less time and provides the necessary skills for easy use of the tool. 8.: Training on the digital communication.
Technological/ DATS level	1. Finding a suitable tool adapted to a specific need or context 2. Not straightforward to exchange tools across borders 3. Development and use of DATS requires too much time 4. Cost for development and/ or maintenance 5. Lack of clear added value for users 6. Poor or inadequate tool functionalities 7. Online tools still depend on following up with an advisor 8. Data ownership	1.: Training on how to use DATS inventory to find suitable tools. 3.: Training for an effective work with DATS. 5.: Communicating about added value for users. 8.: Data protection training.

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As we can see, the barriers highlighted in brown are essentially the same as identified in the D3.3; they can be addressed or somewhat addressed via targeted training and education. The third column "Solutions" clarifies what measures (trainings) must be taken (Table 2). Observations and preliminary lessons learnt from the experience with pilot DATS serve as an input for this work.

Finally, **Deliverable 5.2. Factors influencing use of DATS and UCs** reviews the context specific factors (human, infrastructural, economic, etc.) that influence the adoption of DATS at UC level. The applied methods are DESTEP and SWOT. The DESTEP (Demographic, Economic, Social, Technological, Ecological and Political) analysis provides information about macroeconomic factors that influence the activities and achievements of an organization and identifies external forces that may create opportunities or threats for the given organization. When it comes to SWOT, Strengths, Weaknesses, Opportunities and Threats, the ultimate goal of its analysis is the development and adoption of a strategy resulting in a good relationship between the internal and external factors. The combination of the DESTEP and SWOT analysis allow stakeholders to jointly carry out a broader analysis of the factors that influence the use of DATS in advisory services at UC level. From the summarized results of the DESTEP and SWOT analysis, the most frequently mentioned strengths are *DATS availability*, *Data accuracy*, *Time saving*, while common weaknesses are *Data reliability*, *Data security*, *Lack of user knowledge and motivation, Data literacy*. In terms of external factors *Accessibility*, *Existing infrastructure* and *Level of digital competence* appear many times as opportunities, although, depending on the UCs, the *Lack of relevant digital skills* appear as threat as well, alongside with other common factors such as *Interoperability* or *Age of farmers* both as an opportunity and as a threat, depending on the UCs.

4. Methodology

The background information listed in the previous section was considered in each activity of this task. Depending on the activity, different methodological choices were made. The main activities of the task 6.4. were the following:

1. Identify key target audiences in each UC and their needs.

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2. Compile an inventory of existing training modules and their suitability to address the needs identified in WP1, 2, 3 and WP5 and in CVs Task 6.3.
3. Develop learning outcomes for advisors to support adaption of DATs.
4. Develop a dedicated training framework.
5. Identify resource materials such as module specifications, training videos, teaching exercises assessment and share these through the FAIRshare platform of digital tools or PNF.

The identification of the main audience and their needs (1) was done by analyzing UCs. To provide an outside perspective, a brainstorming session with the partners was held on 2 November 2021.

The inventory of training modules (2) was developed with the partners. It covers all countries involved in the project. All DATS in the FAIRshare inventory were verified to see if any of the tools in the inventory have training or support materials, such as guides or video tutorials, that could be captured (5). Starting in beginning of October 2021, it took nearly 3 months to compile an inventory of 182 existing training modules.

The development of the learning outcomes (3) took place during a brainstorming session with the French partners Resolia (11/01/2022). The results of the brainstorming were then used in the development of the training frameworks.

Finally, the development of the training framework was based on the needs of the main audience and was built on the existing training modules. It was a collaborative effort with partners who participated in grouping trainings by category and skill level. A remote voting session was organized between partners (AC3A, AUA, CEMA, HAFL, INAGRO, I4Agri, LAAS, SEASN, Teagasc, ZLTO) to choose the best fitting trainings for the training frameworks.

5. Results

5.1. Key target audiences and their needs

There are two main target audiences mentioned in all UC: advisors and farmers. In relation to the task 6.4. and in the projection of the task 6.5 “Train the Trainer”’, the most relevant seemed to concentrate on advisors training who, afterwards, could share their digital knowledge with farmers.

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Firstly, the identification of the target audiences' needs (advisors) was based on WP1, 2, 3 and the User/Business Cases (D4.2., D5.3., D.6.1). After summarizing all the data, we have grouped project partners according to the needs they have expressed. We identified three main categories of DATS training that are in demand:

- **Communication tools** (MOfA2, Naturland, LAAS, LKO, INTIA, Inagro, I4AGRI, CAJAMAR, CAFS / SEAN1, IPN)
- **Calculation tools** (NAK, IDELE, IPN)
- **Decision support / Farm management tools** (MOfA1, ZLTO, Teagasc, LKO, EPC, CONSULAI, I4AGRI, CAFS / SEAN1, CAFS / SEAN2, APCA ROA, ISAA).

This information allowed us to determine which DATS our training modules should include.

Secondly, a brainstorming session was organized on 2 November 2021. The digital tool MURAL was used to facilitate the remote brainstorming session among 8 participants who brainstormed together for 90 minutes and exchanged ideas about the needs of the advisors and the missing competences (Figure 3).

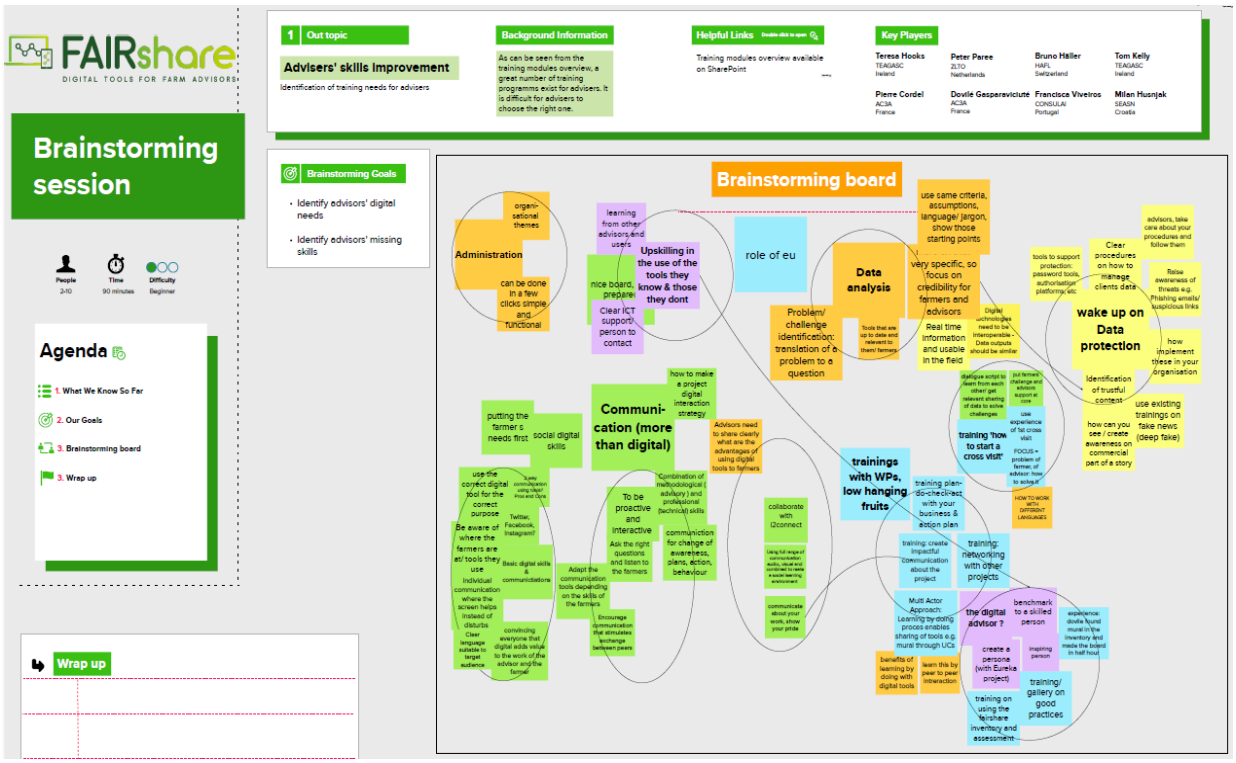

Figure 3 Brainstorm on advisers' needs

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During the brainstorming session, 5 groups of digital skills needs were identified: administration, communication, data analysis, data protection, upskilling.

The cross-referencing of the data from the previous WP and the brainstorming session allowed us to ensure the viability of our findings on the needs of the target audience; therefore the "Data" component has been included in the list of target audiences' needs. In the end, we have three broad categories that encompass the needs of advisors:

- Communication,
- Calculation and Data,
- Decision Support Systems (DSS).

This categorization will be applied for the development of training frameworks (5.4).

5.2. Training modules inventory

As a second section of the results, an inventory of existing training modules was developed. This task was accomplished together with partners by sharing the training modules overview on SharePoint (Figure 4). Training modules are divided into 3 groups which represent the large target audiences:

- trainings for advisors,
- trainings for farmers,
- trainings for both advisors and farmers.

Uploaded by	DATS inventory	Title	Origin	Contact	Language	Target audience	Content keywords	Objective of training	Type of training	Pegagogical methods / Supporting materials	Duration	Duration filter on the platform	Necessary equipment / Conditions	Link / Ad
AC3A	MesParcelles	Mastering the farm management tool "MesParcelles" to improve advisory work	Resolia (France)	resolia@apca.chambagri.fr	French	Advisors	Farm management	to: draw up the regulatory documents; complete the CAP declaration; enhance the value of the farm.	Distance learning	(individual work on resources, quizzes, exercises), correction by a tutor of submitted work. Obtaining the "MesParcelles	14h	11 - 23 hours	*No information*	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=68237a64c96478c26c3f1f9ed5567ef0
AC3A	-	To be managed remotely	Resolia (France)	resolia@apca.chambagri.fr	French	Advisors	Communication remotely	To develop and anchore good practices in order to function and cooperate in a remote group; get organized, anticipate and give feedback.	Distance learning	Methodological contributions. Real-life cases and exchanges of practices. Production in sub-groups.	7h	5 - 10 hours	*No information*	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=875d2e1b378ad3bff239b43c8e9bbe0d
AC3A	-	Making an educational video with a smartphone	Resolia (France)	resolia@apca.chambagri.fr	French	Advisors	Educational video, smartphone	To know the technical characteristics of cell phones for an educational video use. Understand the visual writing, the frame and the essential rules of shooting during a report. Master the formats and export techniques for the web. Training-action which will allow to start from an idea or a project, to test, to experiment or to begin to implement these resources.	Face-to-face, Distance learning	A 2-hour post-classroom virtual class: exchanges and feedback on the productions made, input and advice from the trainer.	19,5h	11 - 23 hours	*No information*	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=b038cc261cb214b5023eecb1469ad9d6
HAFL	RISE	RISE Response-Inducing Sustainability Evaluation	HAFL (Switzerland)	rise.hafl@bfh.ch	German, English, Ukrainian, Danish	Advisors	Sustainability, Evaluation	RISE users work in agricultural consultancy, education, in development projects and in raw material sourcing. The steps of a RISE analysis are goal and scope definition, farmer selection and contacting, data collection and interpretation, farmer feedback	Face-to-face, Distance learning	Introduction into sustainable development and sustainable agriculture (sometimes with a sector-specific focus, e.g. on sustainable dairy farming, or a stronger focus on value chain issues);	8 units (about 30 hours)	≥ 1 day	Computer, Education room	https://www.bfh.ch/dam/jcr:0540a777-ab97-4555-b7ca-bb71904ae97c/what-is-rise.pdf
HAFL	-	Moderating meetings online	Agridea (Switzerland)	cours@agridea.ch	French	Advisors	Digital communication, presentations, interactions	Basic courses for effective meetings, dynamic training and technical events online	Distance learning	Presentations, videos, practical exercises and workshop discussions.	7h	5 - 10 hours	-	A~4054?2~301000~Shop/Courses/Agricultural-advice-and-participatory-methods/Mod%C3%A9rer-en-ligne-cours-en-ligne-via-Zoom-1

Figure 4 Existing training modules overview on SharePoint

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All partners have been asked to develop the online training database available on SharePoint. In total, more than 180 trainings were identified. The categories included in the training modules overview are the following:

- Uploaded by *'acronym of the partner'*
- Title
- Origin (training provider's name and country)
- Language
- Targeted audience (advisors, farmers)
- Content keywords
- Objective of training
- Type of training (face-to-face, distance learning)
- Pedagogical methods / Supporting materials
- Duration
- Necessary equipment
- Link / Additional information

To make the training modules as accessible as possible for potential users, it was then uploaded on the FAIRshare platform in the form of a grid. In order to facilitate their search, training courses can be sorted according to their language, target audience, type of training and duration (Figure 5). Also, a target search by key word is available. All these measures allow to refine the search and find courses more easily.

The training courses inventory on the platform can be edited and new training courses can be added manually or automatically by specific users. In collaboration with WP1, a new functionality could be considered and developed in which assigned administrators can perform CRUD (Create-Read-Update-Delete) actions in the training courses database, on the same principle as DATS Inventory.

Out of 182 training modules collected so far, the most courses are available in French (86), in English (46), in German (32) and in Spanish (17). This repartition of trainings by language had impact on the "Dedicated training framework" (5.4) activity.

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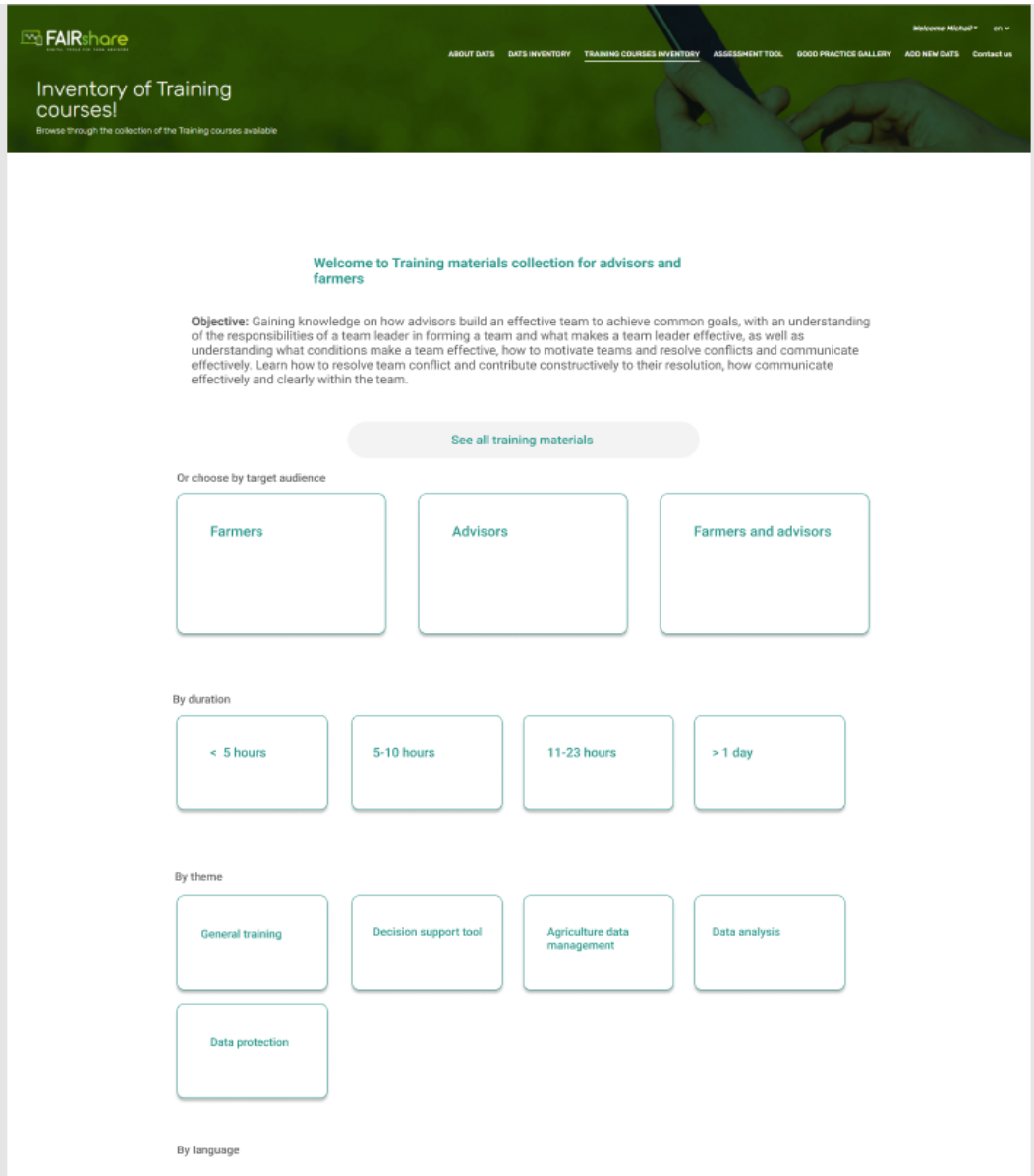

Figure 5 Draft inventory of training courses

5.3. Learning outcomes for advisors

Learning outcomes were developed during a brainstorming session with the joint training and support service of the Chambers of Agriculture network in France “Resolia” and the Association of the Chambers of Agriculture of the Atlantic Area (AC3A). The main brainstorming question was the following: *What training outcomes should be achieved to facilitate the adoption of communication / calculation and data / decision support system digital tools by advisers?*

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This question guided the participants in further exploring the topic and reflecting on the learning outcomes for the three needs groups (5.1). Each participant wrote down their ideas on the post-its of their color. Once a category column was completed, a discussion was conducted to clarify group's ideas. In total, about 60 ideas were noted (Figure 6).

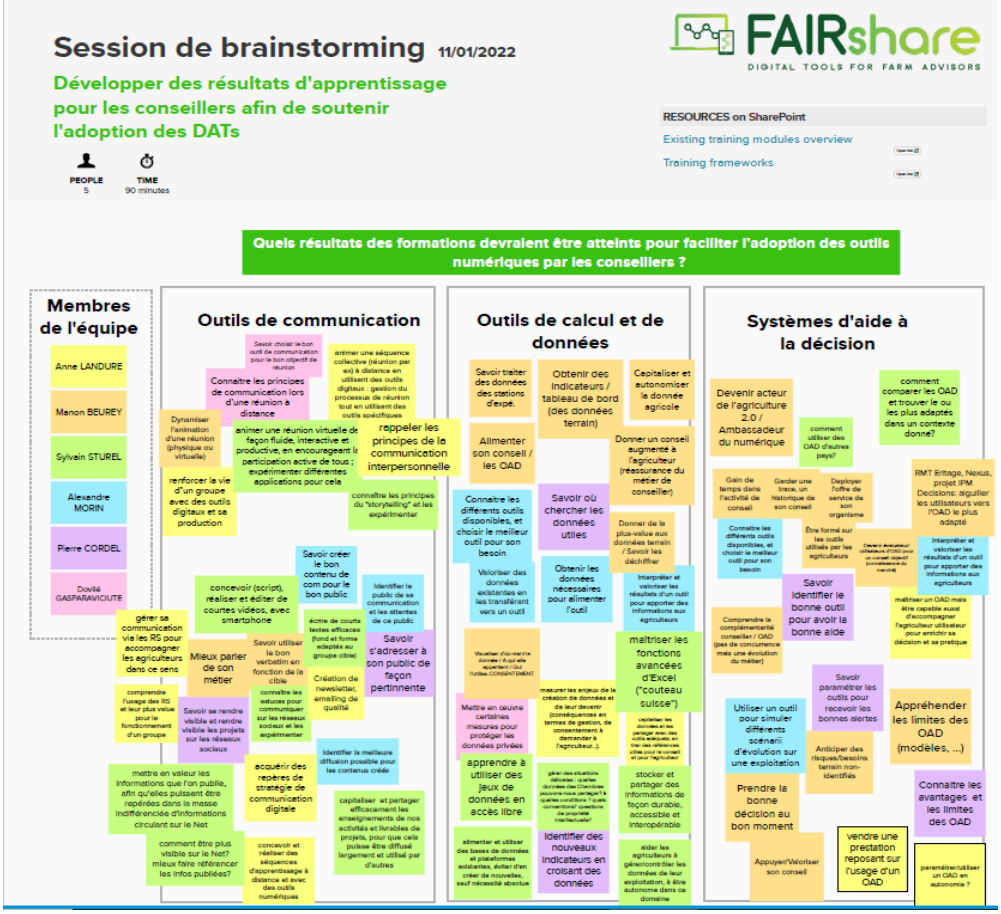

Figure 6 Brainstorm on learning outcomes

The results of the brainstorming session were then used in the development of the training frameworks (5.4).

5.4. Dedicated training frameworks

In this section of results, we focus on the training frameworks, which are an important incentive for the digital tools adoption. In short, what we call training frameworks are series of general type and DATS specific training modules adapted to the participants' needs. We consider that if the participant

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follows this recommended step by step program, at the end, she or he will be comfortable using digital tools of the chosen category. This action brings together the results of the previous activities.

First of all, the results of the Activity 5.1. served as a basis; the identified target group and its needs have been included here. The structure of the training framework has been adapted for agricultural advisers to adopt the use of digital tools in three categories: Communication, Calculation and Data, Decision Support Systems. In addition, as the scale of users' digital skills is very wide and variable, different levels of advancement in digital tools have been distinguished. The three thematic categories mentioned above were then subdivided into two competence levels: basic and advanced users of digital tools. These levels can be defined as follows:

***Basic users of digital tools**: users that are familiar with the basic usage of digital tools (e.g. emailing, texting, web searching) but experience difficulties very quickly. People who may use a number of digital tools on a routine, repetitive or occasional basis.*

***Advanced users of digital tools**: users who have acquired a minimum autonomy and reflective criticism of their own digital practices. People who use a variety of digital tools and seek new innovations regularly. The advanced users are willing to learn and be autonomous in their work they may provide support to other users in their work area or team.*

These definitions will be available next to the training frameworks on the FAIRshare platform to facilitate users' self-identification while choosing a framework.

Secondly, the results of the brainstorming session on learning outcomes (5.3.) were considered in creating the training frameworks. From the existing training modules board, we shortlisted the trainings that met the identified expected learning outcomes: 11 trainings for Communication tools, 16 trainings for Calculation and Data tools, 73 trainings for Decision Support Systems. However, some learning outcomes were not identified in any of the existing training modules, a targeted search for training modules was therefore carried out.

Finally, a remote voting session was organized between partners (AC3A, AUA, CEMA, HAFL, INAGRO, I4Agri, LAAS, SEASN, Teagasc, ZLTO) to choose the best fitting trainings modules for the training frameworks. Partners were invited

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to vote on an Excel sheet available on SharePoint. They had to cast their votes in all three categories, indicating for which level of digital competences (basic or advanced users) the trainings were most suitable (Figure 7).

Training framework "COMMUNICATION"									Target audience, VOTES	
Title	Origin	Language	Content keywords	Objective of training	Type of training	Pegagogical methods / Supporting materials	Duration	Links	Basic	Advanced
Uses of the WEB	CY Cergy Paris Université (France)	French	Basic uses of the web	Searching for and exploiting information; Communicating on the Web; Contributing to the Web; Entering the digital world; Producing a document with others; Understanding digital issues.	Distance learning	MOOC, videos and quizzes. A certification at the end of the programme	18h (6 weeks)	https://www.fun-mooc.fr/fr/cours/usages-du-web/	+++++++++	
Discover, choose and use social networks knowing the safety rules	Chambres d'agriculture de Bretagne (France)	French	Social networks, Digital communciation	Acquire the skills to use the different social networks and internet tools to promote agriculture. Use the internet as an effective communication tool to reach out and raise awareness of the farming profession and	Face-to-face	Presentation, slide show, real life examples on websites, exchanges, practical exercises on the Internet on a computer. A course certificate will be issued after the training.	1 day	http://www.formation-agriculteurs.com/formations/detail-de-la-formation/actualites/decouvrir-choisir-et-utiliser-les-reseaux-sociaux-en-con	+++++++	
To be managed remotely	Resolia (France)	French	Communication remotely	To develop and anchore good practices in order to function and cooperate in a remote group; get organized, anticipate and give feedback	Distance learning	Methodological contributions. Real-life cases and exchanges of practices. Production in sub-groups	7h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=875d2e1b376ad3bff239b		+++++++
Impact of new technologies in the organization			IT tool impact to	Analyze the impact of new technologies in the organization of				https://www.ifeap.fr/nos-formations/formation/62/impact-des-n		

Figure 7 Voting on the training frameworks

The development of the training frameworks ended after summing up the votes. As the majority of the existing training modules were in French (86 out of 182), the training frameworks were mostly built on French language trainings. Here is a summary of the total number of trainings in each category:

- Communication Basic: 6 trainings
- Communication Advanced: 5 trainings

- Calculation and Digital Basic: 7 trainings
- Calculation and Digital Advanced: 8 trainings

- Decision Support Systems Basic: 28 trainings
- Decision Support Systems Advanced: 34 trainings

As we can see, the Decision Support Systems category contains more training than the other two categories. This is because this category includes trainings for specific DATS e.g. *Mastering the farm management tool "MesParcelles" to improve advisory work* (Resolia, France), *Information, advice and training system IKMIS for integrated plant protection* (IKMIS, Lithuania), *Help Irish dairy, beef, and sheep farmers manage their grass production and utilisation with PasturBase tool* (Teagasc, Ireland). It seemed important to keep them all to provide the greatest variety of training for advisors from different agricultural sectors and countries. The established training frameworks can be consulted in the annex (Annex 1).

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Although the training frameworks are largely tailored to French-speaking advisors, they serve as an example for other countries. For instance, the training frameworks can still be used by a Lithuanian advisor as a basis for recommendation, who may then find equivalent trainings in Lithuania.

5.5. Resource materials in the training modules overview

A wide variety of resource materials were identified in the compilation of existing training modules:

- Training videos
- Virtual and face-to-face classes
- Analysis of real-life cases
- Working in sub-groups, group work
- User guides (PDF)
- Presentations
- Quizzes
- Farm visits.

This variety of resources allows the learner to choose a training method according to his or her availability and preferences. The resource materials are indicated in the description of all existing training modules uploaded on the FAIRshare platform (Figure 8).

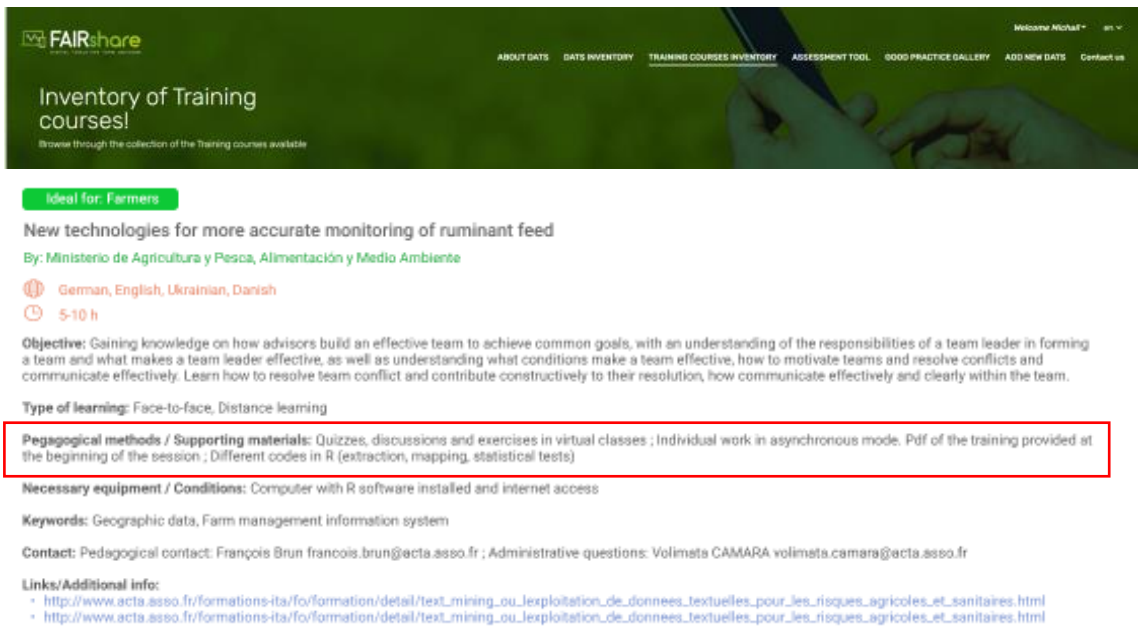

Figure 8 Resource materials of a training

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To facilitate the search for training courses that are linked to specific DATS, a new tab has been created in the detailed information section of DATS. Henceforth, if a DATS has a dedicated training, this information is now available in its description (Figure 9).

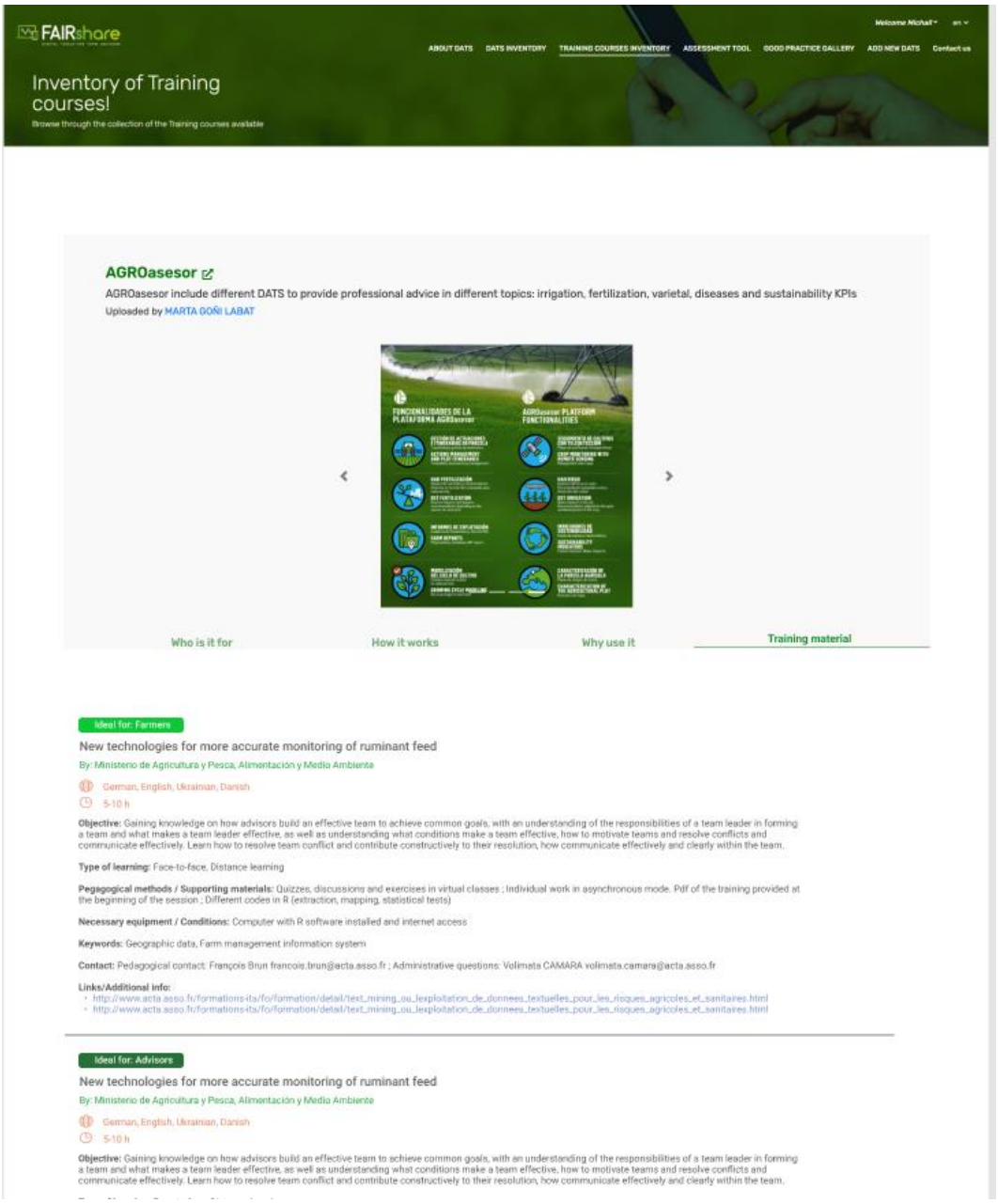

Figure 9 Training material available in DATS description

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6. Points of discussion and conclusion

To conclude this report, we would like to share some brief reflections on the impact of the activities of the task 6.4. on the further work in WP6, on the project in general, and the impact outside the project.

Based on the background information presented at the beginning of this report, the majority of barriers identified in the *Deliverable 3.3. Contextual advocacy and animation approaches* and *Deliverable 4.3 Learning from Ongoing Pilot Adoptions of DATS* can be removed thanks to the availability of suitable training modules. The solutions to distinguished obstacles can be found online on the FAIRshare website in existing training modules section. Also, in the *Deliverable 5.2. Factors influencing use of DATS and UCs*, the most frequently mentioned weaknesses are *Data reliability*, *Data security*, *Lack of user knowledge and motivation, Data literacy*. These weaknesses can be overcome with adapted training, for example, “Privacy in the digital world” (INRIA), “Cybersecurity challenges and issues” (Université Bretagne Sud), “Impact of new technologies in the organization of farmers' work” (IFEAP), “Uses of the WEB” (Cy Cergy Paris Université), and many more that can be found on the FAIRshare platform.

The Task 6.5 which aims to train and support trainers of advisors in the use of digital tools addressing the previously identified gaps will ensure the continuity of the current task. Since the target audience for this work is farm advisors, the training frameworks will be practiced during the “Train the Trainer” workshops for advisors from participating partners and UCs. In those workshops, extensive use will be made of the Training Modules Inventory, in which new trainings can be added.

Lastly, while this work has brought together a large number of existing trainings, it has also identified gaps. The brainstorming session on learning outcomes revealed some outcomes that were not detected in existing trainings. Keeping in mind that our list is not exhaustive, we also evaluate the possibility that this type of training does not yet exist. Therefore, we would like to use this assignment to share the list of these learning outcomes so that training organizations can be inspired to create trainings based on the needs we have identified as unmet:

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Communication category

- Know the principles of storytelling, recall the principles of interpersonal communication
- Identify the audience of your communication and the expectations of this audience; Know how to create the right communication content for the right audience
- Write short and effective texts on social media
- Newsletter creation, writing quality emails

Calculation and data category

- Know how to process data from experimental stations

Decision support system category

- Become an actor of agriculture 2.0 / Digital ambassador
- Keep a trace, a history of advisors advice
- Interpret and valorize the results of a tool to provide information to farmers
- Sell a service based on the use of a DSS

This list was also shared with the training organizations partnering in this project to draw their attention to the unmet training needs of advisers.

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8. Annex

Annex 1: Training frameworks

Training framework "COMMUNICATION" for beginners								
Title	Origin	Language	Content keywords	Objective of training	Type of training	Pegagogical methods / Supporting materials	Duration	Links
Uses of the WEB	CY Cergy Paris Université (France)	French	Basic uses of the web	Searching for and exploiting information; Communicating on the Web; Contributing to the Web; Entering the digital world; Producing a document with others; Understanding digital issues.	Distance learning	MOOC, videos and quizzes. A certification at the end of the programme	18h (6 weeks)	https://www.fun-mooc.fr/fr/cours/usages-du-web/
Discover, choose and use social networks knowing the safety rules	Chambres d'agriculture de Bretagne (France)	French	Social networks, Digital communication	Acquire the skills to use the different social networks and internet tools to promote agriculture. Use the internet as an effective communication tool to reach out and raise awareness of the farming profession and community. Identify the professional interests of Facebook and other tools for farmers.	Face-to-face	Presentation, slide show, real life examples on websites, exchanges, practical exercises on the Internet on a computer. A	1 day	http://www.formation-agriculteurs.com/formations/detail-de-la-formation/actualites/decouvrir-choisir-et-utiliser-les-reseaux-sociaux-en-connaissant-les-regles-de-se
Impact of new technologies in the organization of farmers' work	IFEAP (France)	French	IT tool impact to farmers' work	Analyze the impact of new technologies in the organization of work on farms. Integrate this dimension into advisors' teaching.	Face-to-face	Group work, farm visits.	14h	https://www.ifeap.fr/nos-formations/formation/62/impact-des-nouvelles-technologies-dans-lorganisation-du-travail-des-agriculteurs
Making an educational video with a smartphone	Resolia (France)	French	Educational video, smartphone	To know the technical characteristics of cell phones for an educational video use. Understand the visual writing, the frame and the essential rules of shooting during a report. Master the formats and export techniques for the web. Training-action which will allow to start from an idea or a project, to test, to experiment	Face-to-face and distance learning	A 2-hour post-classroom virtual class: exchanges and feedback on the productions made, input and advice from the trainer.	19,5h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=b038cc261cb214b5023eecb1469ad9d6
Microsoft Teams	Microsoft (USA)	English, French	Digital communication	Learn how to collaborate without compromising privacy and security with the Microsoft Team messaging app: a workspace for real-time collaboration and communication, meetings, file and app sharing.	Distance learning	Video tutorial, webinar	9 min	Video tutorials: https://support.microsoft.com/fr-fr/office/formation-vid%c3%a9o-microsoft-teams-4f108e54-240b
Mentimeter - quick preparation of interactive sheets, with polls, ranking, inventory,	Mentimeter (Sweden)	English	Digital communication, Presentatio	Learn how to create interactive presentations with quizzes, word clouds, polls, etc on Mentimeter	Distance learning	Video tutorial, webinar	55 min	Quick tutorial, presentation : https://www.youtube.com/watch?v=Sd0fAenuAnw Recorded webinar:

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Training framework "COMMUNICATION" for experienced								
To be managed remotely	Resolia (France)	French	Communication remotely	To develop and anchore good practices in order to function and cooperate in a remote group; get organized, anticipate and give feedback.	Distance learning	Methodological contributions. Real-life cases and exchanges of practices.	7h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=875d2e1b376a
Impact of new technologies in the organization of farmers' work	IFEAP (France)	French	IT tool impact to farmers' work	Analyze the impact of new technologies in the organization of work on farms. Integrate this dimension into advisors' teaching.	Face-to-face	Group work, farm visits.	14h	https://www.ifeap.fr/nos-formations/formation/62/impact-des-nouvelles-technologies-dans-lorganisation-du-travail-des-agriculteurs
Energize your remote meetings	Resolia (France)	French	Digital communication	To be aware of the main pitfalls during a remote meeting; know the principles of communication that allow for fluid and efficient exchanges; know how to choose the right tool for the right meeting objective.	Distance learning	Self-training (3h): Tutorial videos, recipe cards, icebreaker kits. Individual work (3h). Virtual classes	14h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=b0dc1e0b4a2f25cd23402006fcb62c6c
Digital tools to enable advisors to connect with their clients virtually and conduct online group activities	Klaxoon	English, French	Facilitation, Online meetings	Digital tools to enable advisors to connect with their clients virtually and conduct online group activities	Distance learning	Video tutorial	19 min	https://klaxoon.com/start-with-tutorials
MURAL - a remote design workshop that is more productive than face-to-face	Mural (USA)	English	Digital communication	Learn how to use MURAL's digital workspace that is optimized for working together synchronously. In this 60-minute session we'll demonstrate how to: Add and format content; Collaborate with others; Start with templates and frameworks.	Distance learning	Video tutorial. Every week Monday and Tuesday, our digital collaboration experts show you the best tips and	20 min	https://learning.mural.co/courses/getting-started#what-is-visual-collaboration

Training framework "CALCULATION AND DATA" for beginners								
Title	Origin	Language	Content keywords	Objective of training	Type of training	Pegagogical methods / Supporting materials	Duration	Links
Uses of the WEB	CY Cergy Paris Université (France)	French	Basic uses of the web	Searching for and exploiting information; Communicating on the Web; Contributing to the Web; Entering the digital world; Producing a document with others; Understanding digital issues.	Distance learning	MOOC, videos and quizzes. A certification at the end of the programme	18h (6 weeks)	https://www.fun-mooc.fr/fr/cours/usages-du-web/
Privacy in the digital world	INRIA (France)	French	Privacy protection	Understand what data you generate when you use a technology; know what your privacy rights are; implement certain measures to protect your privacy.	Distance learning	MOOC, videos and quizzes. A certification at the end of the programme	15h	https://www.fun-mooc.fr/fr/cours/protection-de-la-vie-privee-dans-le-monde-numerique/
Create your own Excel data processing tool	Resolia (France)	French	IT tool management, Excel, Data processing	To know the advanced functions of EXCEL, which can be used for filing, processing and presenting data; adopt a strategy in the construction of a tool; execute practical cases of simulation and data processing.	Face-to-face, Distance learning	Distance learning: independent exercises followed by a tutored project. In class: exercises, exchanges	28h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=37532f95fa26d3c761b849eb394fbd91
Using "My working time calculator"	Resolia (France)	French	Time management	Learn how to operate and use a calculator in order to optimize workload on farms and estimate changes.	Distance learning	Support by a pedagogical tutor and by a technical tutor, virtual class, working	7h	https://resolia.epsilon-informatique.net/FormeisFC/Extranet/index.php?mod=3&ni=7505cf09bdda0
Calculation of the cost of production in herbivore farming	COUPROD (France)	French	Calculation of the cost of production	It allows farmers and advisors to acquire the basics of the production cost approach and to get in touch with the Couprod software. Couprod is a tool for calculating and diagnosing production costs for all herbivore sectors. COUPROD is adapted to all livestock farms (dairy and beef cattle, dairy and beef sheep and	Face-to-face	Several sessions are scheduled in the region, they can also be scheduled at the request of a company with a group of people to	14h	https://idele.fr/detail-formation/formation-calcul-du-cout-de-production-en-elevage-herbivore
CostCheck: The Mastitis Cost Calculator	Teagasc (Ireland)	English	Dairy, Calculator, Animal	To learn using the CostCheck calculator that allows each dairy farmer to estimate the potential gains in profit from reducing the incidence of mastitis on his/her dairy farm.	Distance learning	User guide (PDF)	*No information*	https://www.animalhealthireland.ie/ckfinder/userfiles/files/Final%20CostCheck%20Booklet.pdf
Farm Carbon Toolkit	Farm Carbon Toolkit (United Kingdom)	English	Farm GHS, Calculator	Learn to calculate, understand and reduce farms' greenhouse gas emissions while at the same time improving business resilience and soil health.	Distance learning	Video tutorial	10min	https://www.youtube.com/watch?v=wr6VfFYcBxM&t=309s

Training framework "CALCULATION AND DATA" for experienced								
Title	Origin	Language	Content keywords	Objective of training	Type of training	Pegagogical methods / Supporting materials	Duration	Links
Impact of new technologies in the organization of farmers' work	IFEAP (France)	French	IT tool impact to farmers' work	Analyze the impact of new technologies in the organization of work on farms. Integrate this dimension into advisors' teaching.	Face-to-face	Group work, farm visits.	14h	https://www.ifeap.fr/nos-formations/formation/62/impact-des-nouvelles-technologies-dans-lorganisation-du-travail-des-agriculteurs
Cybersecurity challenges and issues	Université Bretagne Sud (France)	French	Cybersecurity	Reflect on societal issues related to data; Discover the basic principles of cybersecurity; Understand the key elements of the architecture of a cybersecure system.	Distance learning	MOOC, videos and quizzes. A certification at the end of the programme	11h (7 wee	https://www.fun-mooc.fr/fr/cours/defis-et-enjeux-de-la-cybersecurite/
Digital agriculture, discovering and teaching it	Montpellier SupAgro (France)	French	IT tool management in	To propose a general vision of the technologies used and available (Functioning, limits, application cases and types of uses): GPS, remote sensing, sensors and IOT; To share and build collectively	Face-to-face	Presentations, visit of a "digitized" Mediterranean vineyard, reflection, moving	3,5 days	https://www.montpellier-supagro.fr/formations/formation-tout-au-long-de-la-vie/recherche-d-une
Data Science for Agriculture	Acta - les instituts techniques agricoles	French	Data science for agriculture	(Prerequisites: basic knowledge of R software). Acquire the basics to manipulate the main data science methods for prediction purposes ; Learn the real practice of these methods through examples and practical work with the R software.	Distance learning	Quizzes, discussions and exercises in virtual classes ; Individual work in asynchronous mode. Pdf of	19h30	http://www.acta.asso.fr/formations-ita/fo/formation/detail/data_science_pour_lagriculture-1.html
"Couprod" software for production cost calculation	COUPROD (France)	French	Calculation of the cost of production	The training is focused on Couprod software only. COUPROD is adapted to all livestock farms (dairy and beef cattle, dairy and beef sheep and goats) and makes it possible to dissociate livestock costs from costs dedicated to crops.	Face-to-face	Several sessions are scheduled in the region, they can also be scheduled at the request of a company	1 day	https://idele.fr/detail-article/couprod
CostCheck: The Mastitis Cost Calculator	Teagasc (Ireland)	English	Dairy, Calculator, Animal	To learn using the CostCheck calculator that allows each dairy farmer to estimate the potential gains in profit from reducing the incidence of mastitis on his/her dairy farm.	Distance learning	User guide (PDF)	*No information*	https://www.animalhealthireland.ie/ckfinder/userfiles/files/Final%20CostCheck%20Booklet.pdf
RISE (Response-Inducing Sustainability Evaluation)	Bern University of	English	Sustainability analysis	Software manual on how to start the application and login, administrate farms and calculate data.	Distance learning	User guide (PDF)	*No information*	https://www.bfh.ch/dam/jcr:08963837-1c6c-46a1-873f-938f8375
PrHo V.2.0	Cajamar (Spain)	Spanish	Irrigation, ETc, ETo, Greenhous	Learn how to use a decision support system for the calculation of water requirements in greenhouse vegetable crops.	Distance learning	User guide (PDF)	*No information*	https://cos.plataformatierra.es/prho-v-20-programa-de-riego-para

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