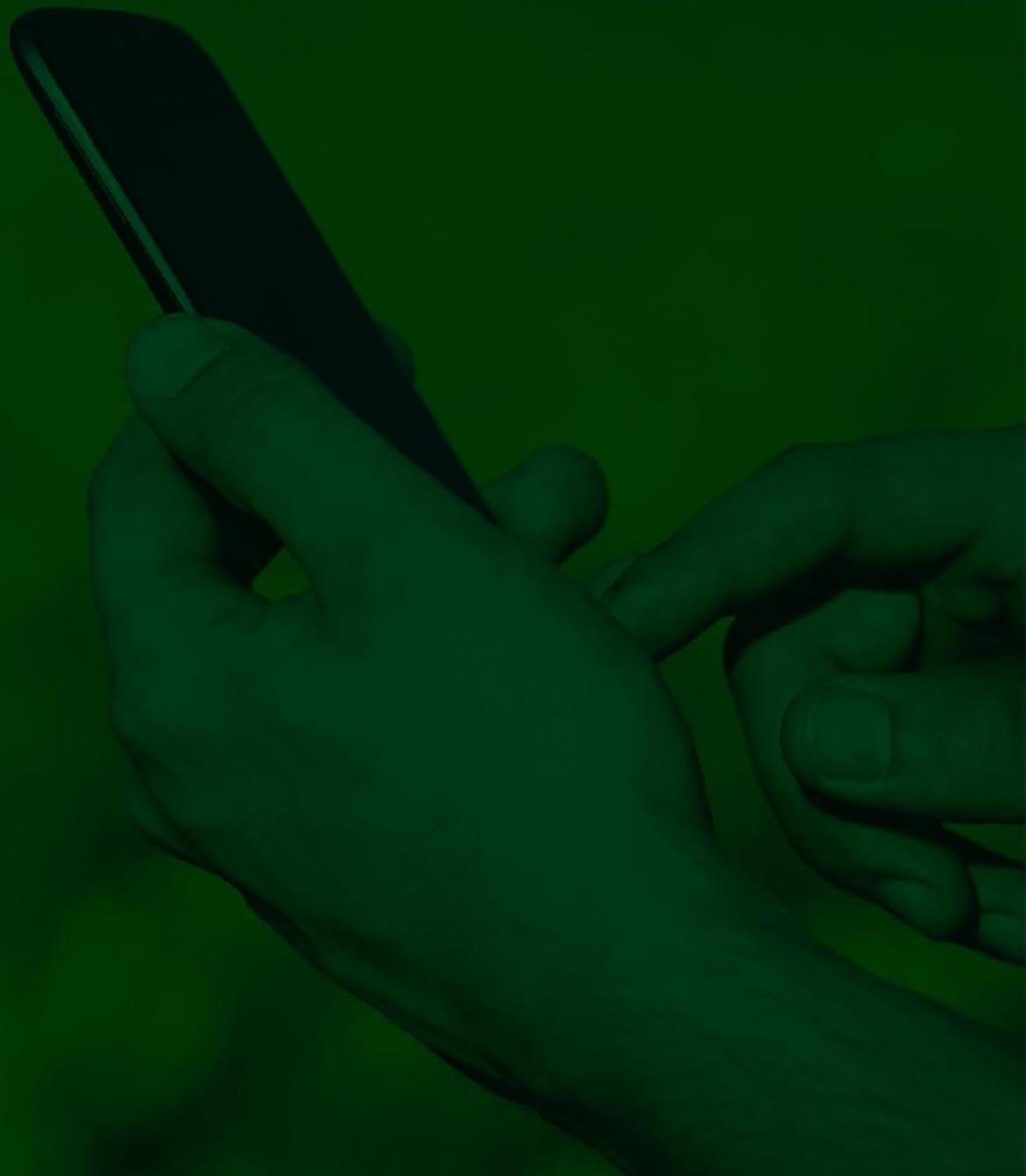




FAIRshare

DIGITAL TOOLS FOR FARM ADVISORS



D3.5: Classification of high impact advisory tools

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1. Introduction

Work Package 3 aims at thoroughly understanding how digital agriculture is advocated and animated in the interface between the advisory and farming communities. We understand the interface between advisors and farmers as more than service provision but a relational locus in which cooperation, collaboration, mutual influence and trust occurs. We will take into account all the social, economic, cultural, technological and policy factors, as well as contextual factors such as geography and farm sector, that condition farmer-advisor interfaces. In WP3 we want to identify how ICT applications have actually become an effective and embedded extension tool in the farmer-advisor interface, paying attention not only to key trends in the ICT applications and diverse interfaces but, crucially, to advisors' advocacy and animation of farm level uptake, use and impact.

Furthermore WP3 explores how powerful advocacy and animation approaches may be extended to interfaces in which they have greatest potential. In this regard, communications and public engagement strategies to simplify, demystify and build trust around ICT use in wider AKIS communities are needed. This WP involves a codesign process to design such strategies, leveraging the power of social media interactions to create a social movement.

Adding another layer to the Good Practice vignettes (Task 2.3), the interface between advisors and farmers will be explored: the attractiveness of and engagement with Digital Advice, novel digital technologies, services and systems. We will pay particular attention to the existing advisory service (AS) practices that adopt, advocate and animate the use of digital advisory tools and services (DATS) in their own customer base and wider farming community. This exploration will be based on opinion and feedback from advisors and farmers.

Four regional multi-actor workshops will explore and guide the selection process of potentially high impact digital tools (HITs) to be used in pilots in WP4. It will also create a realistic level of confidence in the Multi Actor Approach among the project partners.

Task 3.5 (Identify characteristics of user attractive interfaces with DA applications) will provide stakeholders in the Focus Groups with a workable set of characteristics of High Impact advisory Tools (HITs), which in turn will facilitate a productive exchange on ideas to the question: how ICT applications have actually become an effective and embedded extension tool.

2. Objective

Deliverable 3.5 “Classification of high impact advisory tools” (ZLTO) has the objective to provide partners with a *workable set of characteristics*, to facilitate multi-actor focus group meetings in the 4 regional hubs. In Task 3.3 these groups exchange on the question: how ICT applications have actually become an effective and embedded extension tool, the result of which will be published in D3.3: Advocacy and animation of DA applications; in M26.

Therefore WP3 focus groups will:

- Identify examples of successful adoption of digital tools and services with an emphasis on
 - how the advisor and farmer overcame barriers to implementation and
 - how the farmer uses the DATS to improve farm level decision making (supported by a farmers’ and advisors’ review)
- Record users’ ability to road test the applications using real farm data either from their own farm or otherwise.
- Record experience with outputs to gauge their usefulness for their own needs.
- Simultaneously, advisors and application owners will be encouraged to file and promote DATS on the FAIRshare platform).

The exchange will result in a compilation of evidence for a range of good applications with features such as user reviews, filter and search, testimonials and case studies of digital tools giving emphasis on how the adviser and farmer overcome barriers to implementation. This result will be reported in D3.6 (Overcoming barriers to uptake of DA by farmers).

3. Approach

The basic idea is to come up with suggestions: HIT = DATS + impact; so, we should not only describe the DATS, but also their impact (improves decisions, enables better advice, motivates action and encourages change on a larger scale).

In this task, we map the features that are chosen in WP1, WP2 and T3.1. From these characteristics we extract the relevant characteristics for evidence based discussion in focus groups (Table 1).

Table 1 Relevant characteristics of HITs

Activity of focus group	support provided by D3.5
Identify examples of successful adoption of digital tools and services, emphasis:	Descriptive characteristics of DATS Inventory WP1 and DATS Good Practices WP2
How advisor and farmer overcame barriers to implementation	Characteristics of Good Practices: successful actions to overcome barriers: WP2
How farmer uses tech to improve farm level decision making.	Characteristics in Farmers Survey: use of techniques T3.2
Record users' ability to road test apps using real data from farm or otherwise.	Characteristics in Advisors' and Farmers' Survey T3.2
Record experience with outputs to gauge usefulness for their needs.	Characteristics of Advisors' and Farmers' Survey T3.2
(Encourage application owners to file & promote DATS on FAIRshare platform)	n.a.: will be provided by WP7

A prepared set of characteristics is provided to the partners that are involved in this task (T3.5): the Regional Hubs leaders Teagasc, SEASN/CAFS, ZLTO and LAAS, and in addition WP leader AC3A and the other WP3 task leaders: IDELE, LKO, INAGRO, CONSULAI. They rate the most relevant characteristics,

A definition of these characteristics is added in a dictionary. With that we aim to give the stakeholders in the Focus Groups a common understanding of the topics that are important for a successful adoption.

4. Results

In Task 3.5 we developed the language for a better interaction and understanding within the Focus Groups (Task 3.3) when discussing the question: how DATS have become an effective and embedded (high impact) tool.

Using the inventories of WP1, 2 and 3: **DATS Inventory, Good Practices, Needs Assessment**, the characteristics are grouped, checked on overlaps/additional information, and categorized.

DATS	Digital Advisory Tool or Service
Good Practice	Successful approach to use DATS for better advice
User Survey	Survey assessing motivations/ costs/ benefits of farmers and advisors
User Case	Advisor's initiative to improve advice, they select DATS to achieve it
Pilot	Advisors' test to see consequences of using DATS in new context

Characteristic are summarized in a 'project dictionary' where explanations and context are mentioned.

a. Main viewpoints

When describing, testing and reporting the impact of DATS, FAIRshare has assigned different actions, each with a different objective:

1. Collect **Digital Advisory Tools and Services** in a comprehensive **inventory**: in WP1 descriptions of **DATS** are displayed by FAIRshare partners and other organizations that want to showcase their unique tools and services.
2. Showcase **Good Practices**: in WP2 FAIRshare partners collect Good Practices with DATS and analyze, why and how they have impact.
3. A FAIRshare **User Survey** identifies in WP3 motivation, costs and benefits of DATS for **Farmers and Advisors**
4. Select 40 **User Cases**: Advisors describe a digitalisation initiative to improve their advice routines, and select during this initiative the DATS that can help to achieve this challenge. In WP4 such User Cases are accepted/selected 20 from partners and 20 through an open procurement; in WP5 the work is planned and in WP6 implementation and training is organized.
5. Organise **Pilots**: advisory services test the adoption of DATS in Pilots, what happens when DATS are used in a new context: another region or another organization.

So in FAIRshare we can look at the same DATS from 5 viewpoints: the DATS itself(WP1), in a Good Practice (WP2), linked to the Advisor or Farmer Survey (WP3), as contribution to the challenge in a User Case and in a deeper digging Pilots (WP4) and in the implantation and adoption of DATS in each individual User Case.

Table 3 General information captured

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3	ADVISORS SURVEY WP3
Tool/Service name	DAT's Name	type of apps	most useful DATS
Main target groups	DATS Target, aim and Good Practice		description DATS
Agricultural sector		Sector	Sector
Farm Size		Farm Size	
Country of origin /language		Country	Country
Website /access point /use offline?		broadband?	
Cost – structure and type of cost	DAT's presentation		
Year of launch /last update			
Uploaded testimonials	DATs Practice Abstract: summary Good Practice		
Uploaded manuals/sample reports	Pearls, Puzzles, Proposals?		
Images and screenshots	Media or other (e.g. benchmarking data)?		

In the viewpoints from DATS Inventory, Good Practice and Advisor Survey there is a possibility to link the information to specific DATS (red text). This means that the Focus Groups can have very specific discussion on DATS that are mentioned by name.

In those discussions, the farmers' survey can also be used, but the relation with DATS should be made on group level (type of applications or services).

ii. Usability

Usability is really important in the farmer and advisor interface. We constantly see larger numbers of users where the tool or service is easy to use for both advisor and farmer. When DATS are difficult to understand or use, there is also a good chance that farmers and advisors will stop using the tool instead of asking for support. The Good Practice inventory therefore will provide most information on usability (Table 4).

Table 4 Information captured relevant to usability

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3	ADVISORS SURVEY WP3
Software type	Usability & Utility	kind of apps	type DATS used
How it works	Contribution to the efficiency of service	FMIS?	
Source of data –(list, manual, downloadable)	User usability/ User friendliness	save admin time	
Resources and Support.	Functionality	media	media
Keywords to describe tool	Adaptability	IoT data	IoT data
	Improves decision making	hand data documentation	data from where? (hand/3th pa

iii. Data Security

Data Security has become a major issue with the misuse of data and the risk of this on some platforms. So here is where the presence of trust, controls and transparency are important.

The Good Practice inventory is most comprehensive on characteristics on Data Management, but some additional information can be retrieved from answers in DATS Inventory and Surveys (Table 5).

Table 5 Information captured relevant to data security

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3 ADVISORS SURVEY WP3
Multi user access with permission (Y/N)	Data Management Privacy & security Data application & presentation Data quality & reliability Data sharing capabilities FAIR principles applied	share data with... share advisor? 3th party? which parties get data?

iv. Benefits and Challenges (B&C)

Table 6 Information captured relevant to benefits regarding implementation, success, transferability

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3 Advisors&Farmers survey
Benefits DATS Top 5 benefits Next best 5 benefits	Implemented with positive results; HOW Successful, (innovative), tested and validated HOW Transferable: can adopt, adapt other context; HOW Benefits/Impacts Farmers Benefits/Impacts Advisors The Good Practice attached to this DATS (what's in it for you)	benefits ICT / impact benefits ICT / impact: (items in yellow below)

You cannot separate benefits from challenges: when you define a challenge, you hope DATS will give benefits. In the next blocks about Environment & Nature and Business & Economy, the benefits (in yellow, so not only in 4.2.4, but also in 4.2.4 and 4.2.6) mentioned in the Advisor's and Farmers Surveys have strong overlap in the subject of challenges, which are mainly recorded and displayed in DATS inventory.

Benefits of DATS are also collected with a different approach: on achievement in implementation, success and transferability (Table 6).

v. Benefits and Challenges: Environment & Nature

Table 7 Information captured relevant to challenges

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3 Advisors&Farmers survey
Challenges adressed Plant protection management Nutrition/Fertilisation management Water management Livestock Green House Gas Livestock management/care/feed	Environmental hot topics Management of natural resources Environmental monitoring & control Management of natural resources (2) Climate	Topics: production management Increase of productivity Minimization of input costs Optimization of resource use Environmental protection environmental issues Climate adaption&resilience Control of animal health

Environmental issues are described most specific in DATS Inventory as challenge, in Farmers/Advisors survey as benefit. Both viewpoints give a lot of information. Additional information comes from Topics in Good Practices. Challenges of Environment & Nature include e.g. climate change, biodiversity, and water. These are also important levers of change as new tools and services open doors for advisors to help farmers meet these challenges.

To address these challenges and manage at the same time profitability, supply chains and labor, etc., the need for better use of data and supporting DATS grows (Table 7).

vi. Benefits & Challenges: Business & Economy

Table 8 Information captured relevant to business and the economy

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3	Advisors&Farmers survey
Compliance with legislation and standards CAP management Strategic planning Finance and budgeting Operational management focus Post-harvest management Harvest prediction Logistics Markets and sales Sustainable food production and healthy diets Work safety	Business, Legal, & Regulatory hot topics Business model Earning model Intellectual property Value proposition business model (2)	legal subsidy management administration distribution supply chain alternative business	Compliance record management Effective strategy planning Financial assessment/reporting Operational management Improvement of yield quality Limit exposure to chemicals Limit human injuries Task/ time management Labor saving/ limit stress Increase of profit/farm income
	Economic hot topics Advisory services level Farm level Macro level		

Also on business, characteristics are gathered in DATS Inventory.
On Economy, Good Practices describe topics on level of Advisory Service, Farm Level and Macro Level (Table 8).

vii. Brokerage

Table 9 Information captured relevant to knowledge brokering

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3	ADVISORS SURVEY WP3
Top 5 challenges addressed Next best 5 challenges addressed	Knowledge Brokering hot topics Effective AKIS Enhanced knowledge exchange advisors Enhanced knowledge exchange farmers	who influenced to digi ict in advice attitude ICT farmer information sources/org's frequency advice which advice for decision type of decision, examples	advice on digitization attitude ICT advisor % farmers ICT use personalise to indiv

Knowledge brokerage aims to develop relationships and networks with, among, and between producers and users of knowledge by providing linkages and knowledge sources to organizations in its network. Of direct importance for the ICT introduction in Advisory Services are the characteristics for brokerage: for what kind of advice can the DATS be used? How useful is it in the AKIS structure of the people working with the tool? (Table 9).

viii. Users

Table 10 Information captured relevant to users

DATS WP1	DATS GOOD PRACTICE WP2	FARMERS SURVEY WP3	ADVISORS SURVEY WP3
Who is the user? Number of users - live /downloads Owner/Creator (possible to insert multiple entries)	Social hot topics User centred Improves quality of life for advisor/farm Gender and age considerations Addresses societal issues	Education legal status who manages data gender age preferred support	Education Organisation Role in organisation experience yrs gender age preferred support current support DATS which training need
Training required to use (Y/N)			

At the end, the users decide if a DATS is a high Impact Tool (HIT): if an advisory tool or service has high impact for their and their organisations work. So, the description of the users/target group is decisive to estimate the conclusions on implementation, success and transferability. As might be expected, the most relevant information on User characteristics will come from the User Surveys (Table 10).

c. A dictionary of characteristics

In the four inventory viewpoints above, characteristics are used in different contexts, but often with a clear overlap. Without overlaps we come to 70 characteristics that can serve as input for the Focus Group discussion.

Each characteristic gets a name, based on the names already used in the inventories. In order to give the Focus Group members a common understanding of the topics, the contributions to successful adoption are described for each characteristic. The names of characteristics are reviewed by the cluster Leads Teagasc, SEASN/CAFS, ZLTO and LAAS, and WP3 Task leads (AC3A, IDELE, LKO, INAGRO, CONSULAI). In this way the descriptions are connected to the context of different regions.

In Table 11 these characteristics names and contribution to successful adoption are summarized.

Table 11 Summarization of characteristics

characteristics dictionary	Description and contribution for successful adoption
GENERAL	
Name of DATs	
Description	
Sector	All sectors covered
Farm Size	Reflections on size
Country	All regions covered
Web access	Easy to find/ Efficient use of web access, proxies when needed
Cost structure of DATS	Lower Cost with possibility of free trial period
Maintenance of DATS	Regular updates without disruption to users data
Practice Abstracts	Relevant examples for farmers and advisors
Experiences	Shared experiences of users (farmers and Advisors)
Visuals	Visually attractive examples and illustrations
USABILITY	
Type of DATS	Variety of types of DATS
Integration	Integrated to infrastructure, data sources, business information
Efficient work	Saves time or reduces workload (more efficient service delivery)
User friendliness	Easy to use, user friendly, compatible to telephone, tablets etc
Auto Data Input	Little manual data input; single data entry multiple use
Data input documentation	Clear which data is imported
Supportive	Clearly defined which activities are supported
DATA MANAGEMENT	
<i>Data management strategy</i>	<i>Data users' rights well defined /comply to Code of Conduct</i>
Data security	Safe storage, transfer and access of data
Data presentation	Visualisation understandable for farmer / advisor
Data reliability	Integrity of data is checked in a well-defined way
Data sharing	Easy shared access to tool, service and data
FAIR	Data is Findable, Accessible, Interoperable, Reusable
CHALLENGES&BENEFITS(C&B)	
<i>Evaluate implementation</i>	<i>These 3 questions are about results</i>
<i>Evaluate success</i>	<i>Other questions are reason for these results</i>
<i>Evaluate transferability</i>	<i>support from science where needed.</i>
Challenges/Benefits general	Save time, money, workload; Better decisions, confidence.
Diagnosis support	Easy problem diagnosis, advise based on data instead of field visit
Decision support	Better and well explained decisions
C&B: ENVIRONMENT/NATURE	
<i>technical result visualisaton</i>	<i>Improvement of technical & sustainability results clearly visualised</i>
production management	DATS improve production management
cost management	cost management
resource management	natural resource management
environmental management	environmental management
climate/risk management	water/climate/risk management
animal health management	animal health management
C&B: BUSINESS/ECONOMY	
compliance management	compliance management
subsidy management	subsidy management
strategic management	strategic management & planning
financial management	financial management
operational management	operational management
quality management	quality/growth management (seed-harvest)
harvest prediction	harvest prediction
logistic management	logistic management
marketing	marketing & communication
residue management	value chain management
safety management	health&safety management
time management	time management

personnel management <i>economic result visualisation</i> advisor service economy farm economy macro economy	personnel management <i>Results are related to money (earnings/savings)</i> DATS improve economic position of Advisory Services DATS improve economic position of Farmers DATS give economic advantages in general
CHALLENGES: BROKERAGE	
<i>interaction strategy</i> AKIS structure ICT attitude advisor ICT attitude farmers Individual/Group advice Frequency of advice Advice-Decision interaction Advisory support	<i>Clear story on interaction strategy and effectiveness of it.</i> Support Advisory Knowledge & Innovation Support services DATS stimulate advisors to work with ICT Farmers see how their data contribute to better/accurate advice Clearly specified if DATS work in individual and/or group advice DATS enhance more frequent advice Clearly specified which advice is needed in combi with DATS Clearly specified which decisions are supported
USERS	
<i>User centred</i> Education level Type of employment Role in organisation Experience Gender Age Support preference Support offered Training need	<i>Using the language and approach of DATS' users</i> DATS work for relevant education levels types of employment roles in organisation levels of experience Language is gender neutral All ages understand language used Clearly specified what support is needed in combi with DATS Where relevant, affordable support offered Clearly specified under which conditions training is needed

d. Relevance of characteristics

70 characteristics are a bit much to have a focused conversation in the Focus Groups. Therefore we did an experiment where the cluster leads Teagasc, SEASN, ZLTO and LAAS, and also LKO, CONSULAI, CAFS (2 per region) scored the characteristics on a scale of 1 (not important) to 5 (very important). They used the description (the 2nd column in the table above) as support.

The result is shown in Table 12, below.

Table 12 Scoring of characteristics

characteristics dictionary	W		M		SE		N		AVG
	lead	2	lead	2	lead	2	lead	2	
GENERAL									
Name of DATs									
Description									
Sector	1	4	1	3	3	4	4	4	3
Farm Size	1	4	1	4	2	4	5	4	3,1
Country	1	4	1	2	4	5	4	4	3,1
Web access	5	3	2	5	4	4	5	5	4,1
Cost structure of DATs	5	4	3	5	5	3	5	5	4,4
Maintenance of DATs	4	3	4	5	4	4	3	4	3,9
Practice Abstracts	5	4	3	4	3	5	5	5	4,3
Experiences	5	4	3	2	5	4	4	4	3,9
Visuals	5	4	3	3	2	2	4	3	3,3
USABILITY									
Type of DATs	3	3	4	3	5	3	5	4	3,8
Integration	5	4	5	4	2	3	5	5	4,1
Efficient work	5	4	5	4	4	4	4	5	4,4
User friendliness	4	4	5	5	5	5	4	5	4,6
Auto Data Input	5	3	5	2	4	3	3	2	3,4
Data input documentation	3	3	4	4	5	4	5	5	4,1
Supportive	5	4	5	4	5	5	2	4	4,3
DATA MANAGEMENT									
<i>Data management strategy</i>	5	4	5	5	3	5	4	3	4,3
Data security	5	3	5	5	5	5	4	5	4,6
Data presentation	5	4	5	5	2	5	5	5	4,5
Data reliability	5	3	5	4	5	5	5	5	4,6
Data sharing	5	4	4	3	3	5	5	5	4,3
FAIR	5	5	5	3	5	4	4	4	4,4
CHALLENGES&BENEFITS(C&B)									
<i>Evaluate implementation</i>									
<i>Evaluate success</i>									
<i>Evaluate transferability</i>									
Challenges/Benefits general	5	5	5	3	4	4	5	5	4,5
Diagnosis support	5	4	4	4	5	5	5	5	4,6
Decision support	5	4	5	4	4	4	4	5	4,4
C&B: ENVIRONMENT/NATURE									
<i>technical result visualisaton</i>	5	4	5	5	3	3	3	3	3,9
production management	4	4	3	4	3	4	5	5	4
cost management	4	5	3	4	2	4	4	4	3,8
resource management	3	5	3	4	2	4	5	5	3,9
environmental management	4	3	4	3	4	4	5	3	3,8
climate/risk management	4	3	4	2	3	4	5	3	3,5
animal health management	4	4	4	4	5	4	4	4	4,1
C&B: BUSINESS/ECONOMY									
compliance management	5	4	3	3	3	5	3	4	3,8
subsidy management	5	4	2	5	4	5	5	5	4,4
strategic management	5	4	5	3	2	5	5	4	4,1
financial management	5	4	4	4	3	5	5	5	4,4
operational management	5	4	5	4	2	1	3	4	3,5
quality management	5	4	4	2	4	4	3	5	3,9
harvest prediction	3	3	1	3	3	4	4	4	3,1
logistic management	4	4	4	3	3	3	2	3	3,3
marketing	5	3	4	2	4	4	2	4	3,5
residue management	5	3	3	3	5	4	2	3	3,5
safety management	5	4	5	4	5	3	5	4	4,4
time management	5	4	4	4	4	3	3	3	3,8

personnel management	5	4	3	3	4	4	3	4	3,8
<i>economic result visualisation</i>	4	4	4	5	5	4	4	3	4,1
advisor service economy	5	5	4	3	5	3	4	4	4,1
farm economy	5	5	5	5	4	4	5	5	4,8
macro economy	3	4	3	4	4	4	4	4	3,8
CHALLENGES: BROKERAGE									
<i>interaction strategy</i>	4	4	4	4	4	3	3	3	3,6
AKIS structure	5	5	3	?	4	5	5	3	4,3
ICT attitude advisor	5	5	4	3	4	4	5	5	4,4
ICT attitude farmers	5	5	5	5	4	4	4	4	4,5
Individual/Group advice	5	4	3	2	3	3	3	4	3,4
Frequency of advice	3	5	4	3	3	4	4	4	3,8
Advice-Decision interaction	3	5	2	2	3	5	5	5	3,8
Advisory support	5	4	4	2	4	4	4	5	4
USERS									
<i>User centred</i>	5	3	5	5	5	3	5	4	4,4
Education level	5	4	4	2	5	4	4	3	3,9
Type of employment	5	3	4	3	1	4	4	4	3,5
Role in organisation	5	3	4	3	3	4	4	3	3,6
Experience	5	3	4	4	3	5	5	5	4,3
Gender	5	2	3	3	2	4	1	1	2,6
Age	5	4	3	2	3	4	2	2	3,1
Support preference	5	4	4	4	4	5	5	5	4,5
Support offered	5	4	5	5	4	4	4	4	4,4
Training need	5	4	3	3	5	5	5	5	4,4

It proved easy and fast to fill this overview. With the colors (standard function in excel) an overview is produced swiftly. This overview can give a clear focus in the discussion; it is proposed to focus in the discussion on the 26 characteristics that score higher than 4 on average. At the same time such a selection should be reviewed well: now the block Environment/Nature scores mostly below 4, but is should not be forgotten.

5. Conclusions

With contribution of related partners, T3.5 was able to compose a dictionary that can facilitate the Focus Groups' discussion from a shared understanding. In Task 3.3, the program of the Focus Group meetings will be tailored to the context of the different regions, but this list of HITS characteristics may serve as a good starting point, and as a tool to integrate experiences in different stories to coherent stories.

When more people fill this inventory, it could say something about differences in focus subjects over countries or regions.

6. Discussion

In this report, the HITS Characteristics used in WP1, 2 and 3 are classified. Table 12 provides a workable set of the characteristics of HITS.

In the Focus Groups, the characteristics dictionary can be used in different ways:

- In preparation of the examples for discussion: use the same wording and link them to the same ambitions. In this way the results of DATS inventory, Good Practice Analysis and Farmers' and Advisors' Survey are presented in a congruent way.
- In making the agenda for the meeting: the categories are a good starting point to set up the agenda, but at the same time: take care that all characteristics groups will be covered in discussion.
- In choosing subjects to focus on in the specific group. With limited time investment, a table, like table 12, can be produced with the focus group audience, and serve to
 - o bring focus in the discussed subjects (4+ subjects)
 - o map the individual focus of the participants (you are green, I'm red, that is interesting)
 - o make an overview over the focus group meetings, to analyse if focus is different in different regions.
- In the reports: describe the discussions in a congruent way.

The use of this overview of characteristics will help to enhance the preparation, execution and reporting on the focus group meetings.

This is additional to the models and scientific insights that are summarized in D3.1: "Factors influencing adoption of DA tech by farmers and advisors" (Figure 2). It will be useful to relate the characteristics, apart from the *impact* of HITS (Evaluate implementation, success and transferability; as done in the Good Practice analysis), also to *uptake* factors, as described in D3.1.

Rose *et al.*, (2016)¹ distinguished Core Factors, Modifying Factors and Driving Factors (figure 2).

The characteristics dictionary from T3.5 and model from T3.1 can come together to form an effective program of the Focus Groups in T3.3 and create optimal understanding of the

question: why and how DATS have impact in the advisory and farming communities?

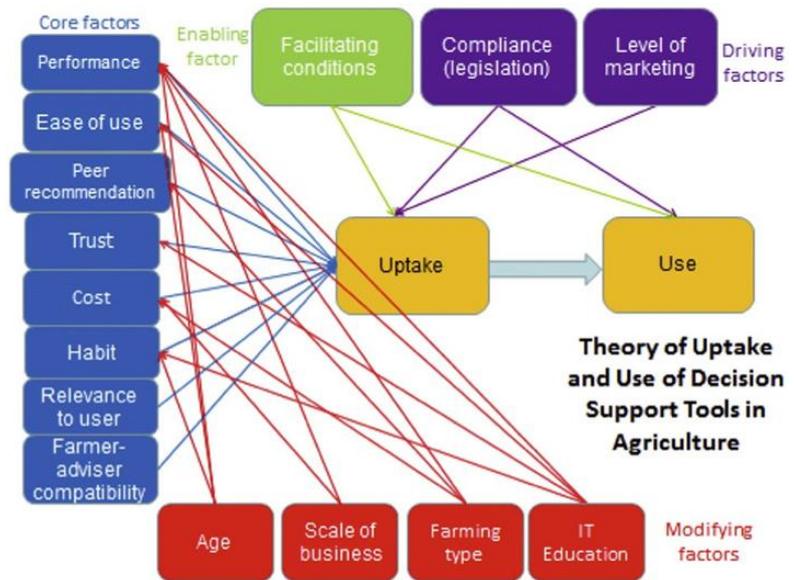


Figure 2 Factors influencing adoption of DA tech by farmers and advisors

¹ David C. Rose et al; Decision support tools for agriculture: Towards effective design and Delivery, Agricultural Systems 149 (2016)

7. Annex: characteristics of tools in FAIRshare

a. Inventory DATS (WP1)

1. About the tool or service; gathering the following general overview information about DATS in an easy to use structures web page, with list and yes/no buttons used where possible. From the data entered here it will be possible to catalogue the tools and provide use full user information.

- Tool/Service name
- Country of origin
- Language (s) (drop down list, multiple selection)
- Website /access point
- Cost – structure and type of cost
- Year of launch
- Year of last update
- Number of users - live
- Number of down loads
- Owner/Creator (possible to insert multiple entries)

2. Description; what it does and for who? This section gathers more detailed data on the user and application of the DATS, also the complexity and user training need.

- Who is the user? (list)
- Main target groups (multiple selection)
- Agricultural sector (list)
- Software type
- Use offline (Y/N)
- Source of data –(list, manual, downloadable)
- How it works (limit of words)
- Multi user access with permission (Y/N)
- Training required to use (Y/N)

3. Challenges addressed by the DATS; This gathers information related to the challenge or problem to which the DATS may be applied in practice. This is to help the user find or identify a solution DAT to their need.

- Top 5 challenges addressed
- Next best 5 challenges addressed

4. Benefits of the Tool; This enables the benefits of the DAT or Service to be recorded and promoted and will support the new users of the ‘Digital Advisor’ platform in seeing the positive attributes as recorded by the DATS owner or existing user.

- Top 5 benefits

- Next best 5 benefits

5. Resources and Support; This section records the look and feel of the DATS and provides useful support information and images including user testimonials.

- Keywords to describe tool
- Images and screenshots
- Uploaded manuals/sample reports
- Uploaded testimonials

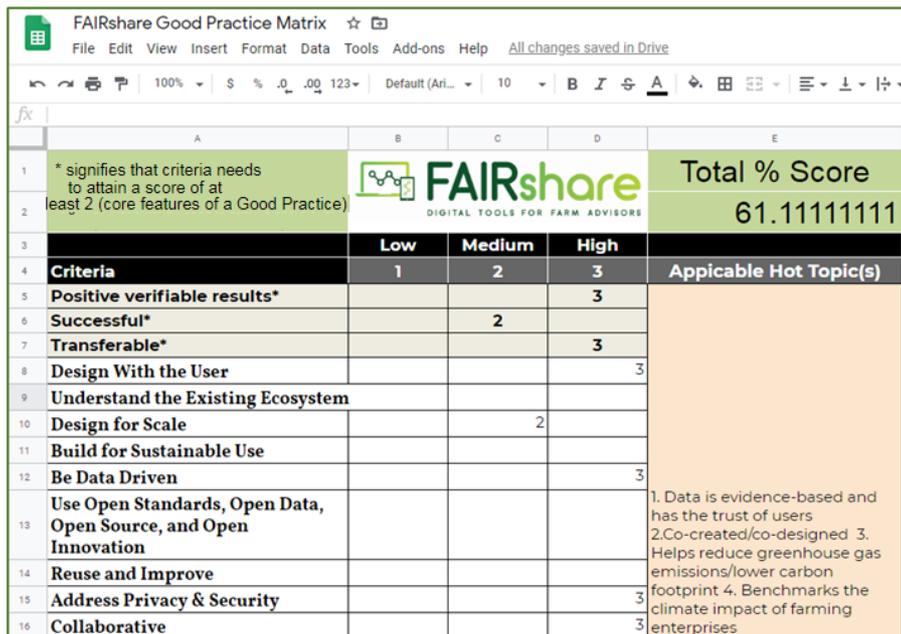
b. Good Practice DATS (WP2)

Author(s) name; mail, Name of organization, Web site

DAT's presentation

- DAT's Name
- Objectives for farmers (benefits/impacts)
- Objectives for advisors (benefits/impacts)
- Media or other (e.g. benchmarking data)?
- The Good Practice attached to this DATS (what's in it for you)
 - Implemented with positive results; HOW
 - Successful, (innovative), tested and validated: improved performance of an entrepreneurship, this contribution is recognised; HOW
 - Transferable: it can be adopted in and adapted to other contexts."; HOW
- DATS Target, aim and Good Practice
- DATs Practice Abstract:
- Short summary of the DAT's target, aim and ""Good Practice"" outcomes, interesting for farmers/end-users, entrepreneurial elements
- Pearls, Puzzles, Proposals?
- Hot Topics
 - Social
 - User centred
 - Gender and age considerations
 - Improves quality of life for advisor/farmer
 - Addresses societal issues
 - Economic
 - Advisory services level
 - Farm level
 - Macro level
 - Environmental
 - Management of natural resources

- Climate
 - Environmental monitoring & control
- Knowledge Brokering
- Effective AKIS
 - Enhanced knowledge exchange advisors/farmers
 - Enhanced knowledge exchange farmers/advisors/research
- Business, Legal, & Regulatory Frameworks
- Business model
 - Earning model
 - Intellectual property
 - Value proposition
- Data Management
- Privacy & security
 - Data application & presentation
 - Data quality & reliability
 - Data sharing capabilities
 - FAIR principles applied
- Usability & Utility
- Contribution to the efficiency of service
 - User usability
 - Functionality
 - Adaptability
 - Improves decision making
 - User friendliness



	A	B	C	D	E
1	* signifies that criteria needs to attain a score of at least 2 (core features of a Good Practice)				Total % Score
2					61.11111111
3		Low	Medium	High	
4	Criteria	1	2	3	Applicable Hot Topic(s)
5	Positive verifiable results*			3	1. Data is evidence-based and has the trust of users 2.Co-created/co-designed 3. Helps reduce greenhouse gas emissions/lower carbon footprint 4. Benchmarks the climate impact of farming enterprises
6	Successful*		2		
7	Transferable*			3	
8	Design With the User			3	
9	Understand the Existing Ecosystem				
10	Design for Scale		2		
11	Build for Sustainable Use				
12	Be Data Driven			3	
13	Use Open Standards, Open Data, Open Source, and Open Innovation				
14	Reuse and Improve				
15	Address Privacy & Security			3	
16	Collaborative			3	

Figure 3 Good Practice Assessment Matrix (D2.1)

c. Needs Assessment Advisors (WP3)

i. A Demographic

In which country are you located? (Please write in the name of your country)

1. What is the highest educational level you completed? (Please tick the relevant box)

Elementary /primary school	<input type="checkbox"/>
Secondary school	<input type="checkbox"/>
Technical school and/or apprenticeship (approx. 2-4 after secondary school)	<input type="checkbox"/>
University (any level - Bachelor, Master or PhD)	<input type="checkbox"/>

2. For which kind of organization do you work? (Please tick the relevant box)

Self-employed farm advisor	<input type="checkbox"/>	Chamber of Agriculture	<input type="checkbox"/>
Public sector advisory services	<input type="checkbox"/>	Local farmers' group	<input type="checkbox"/>
Farmers association/Farmer union	<input type="checkbox"/>	Agri-input supplier	<input type="checkbox"/>
Bank, legal counsel, accountancy firm etc.	<input type="checkbox"/>	Agri-tech provider	<input type="checkbox"/>

3. What is your role in the organization? (Multiple selection possible)

Farm advisor	<input type="checkbox"/>	Project officer/project manager	<input type="checkbox"/>
Advisor with support role	<input type="checkbox"/>	Manager/Coordinator	<input type="checkbox"/>
Trainer	<input type="checkbox"/>	Other (please specify): _____	<input type="checkbox"/>

4. To which of the following topics do you offer advisory services? (Multiple selection possible)

- Cereal production
- Vegetable production
- Plant production (other)
- Dairy production (cows)
- Dairy production (other)
- Meat production in general (beef)
- Meat production in general (sheep)
- Meat production in general (pigs)
- Meat production (poultry)
- Meat production (other)
- Aquaculture
- Farm-based added-value/diversification processes
- Farm management & Economics support
- Other (please specify): _____

5. How old are you? (Please tick the relevant box)

< 20	<input type="checkbox"/>	40-49	<input type="checkbox"/>
20-29	<input type="checkbox"/>	50-59	<input type="checkbox"/>
30-39	<input type="checkbox"/>	>60	<input type="checkbox"/>

6. For how long have you been working as a farm advisor/in the farm advisory field?
(Please tick the relevant box)

less than 1 year	<input type="checkbox"/>	6 - 10 years	<input type="checkbox"/>
1 – 2 years	<input type="checkbox"/>	11 -20 years	<input type="checkbox"/>
3 - 5 years	<input type="checkbox"/>	more than 20 years	<input type="checkbox"/>

7. Gender (Please tick the relevant box)

Male	<input type="checkbox"/>	Other	<input type="checkbox"/>
Female	<input type="checkbox"/>	Prefer not to say	<input type="checkbox"/>

ii. Part B – Digitalization and farm advisory

8. What is the degree of personalization (to the farmer's needs) in your farm advisory services? (Please tick the relevant box)

less than 10%	<input type="checkbox"/>	51 – 65%	<input type="checkbox"/>
10 – 20%	<input type="checkbox"/>	66 – 80%	<input type="checkbox"/>
21 – 35%	<input type="checkbox"/>	>80%	<input type="checkbox"/>
36 – 50%	<input type="checkbox"/>		

9. To which of the following categories do your digital farm advisory services (DATS) belong to? (Multiple selection possible)

One-to-one farm advisory (online, phone call, personal, text)	<input type="checkbox"/>	Online discussion and knowledge exchange groups	<input type="checkbox"/>
Social media	<input type="checkbox"/>	Radio, TV	<input type="checkbox"/>
Digital newsletter	<input type="checkbox"/>	Blogs at regular times	<input type="checkbox"/>
Chats, forums, message groups	<input type="checkbox"/>	E-mapping, Drawing	<input type="checkbox"/>
Tutorials	<input type="checkbox"/>	E-Learning Platforms	<input type="checkbox"/>
Webinars/Farminars	<input type="checkbox"/>	Videos	<input type="checkbox"/>
Messenger services	<input type="checkbox"/>	Infographics	<input type="checkbox"/>
Mobile apps	<input type="checkbox"/>	Analysis and benchmarking	<input type="checkbox"/>
Farm advisory subscription services (e.g. an annual or monthly advisory farm plan)	<input type="checkbox"/>	Real time monitoring and decision support	<input type="checkbox"/>
Client Billing Management	<input type="checkbox"/>	E-applications and regulations	<input type="checkbox"/>
Customer Relationship Management	<input type="checkbox"/>	I do not offer DATS	<input type="checkbox"/>

10. What kind of information do farmers request from you in the context of digitalization?
(Multiple selection possible)

Digital tools for specific farm services (e.g. milking robots, fertiliser, yield mapping,...)	<input type="checkbox"/>
Technical information (hardware, software) in the context of digitalisation	<input type="checkbox"/>
Information about the use of social media	<input type="checkbox"/>
Information related to preparation and submission of online subsidy forms	<input type="checkbox"/>
Information about Internet of Things (IoT) solutions	<input type="checkbox"/>
Advice about data privacy and security	<input type="checkbox"/>
Information about the use of online products and services (webpage, apps, web shop, online newsletter)	<input type="checkbox"/>

Information about information systems or services for farm management (e.g. electronic time records etc.)	<input type="checkbox"/>
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11. What percentage of your clients (farmers) use digital tools in their activity (e.g. for communication, farm management, crop management, animal management etc.)?
(Please tick the relevant box)

less than 10%	<input type="checkbox"/>	51 – 65%	<input type="checkbox"/>
10 – 20%	<input type="checkbox"/>	66 – 80%	<input type="checkbox"/>
21 – 35%	<input type="checkbox"/>	>80%	<input type="checkbox"/>
36 – 50%	<input type="checkbox"/>		

12. Please indicate to which extent you agree/disagree with the main benefits/positive impacts associated with DATS. (1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

DATS Impact	1	2	3	4	5
Increase of productivity	<input type="checkbox"/>				
Improvement of yield quality	<input type="checkbox"/>				
Optimization of resource use	<input type="checkbox"/>				
Environmental protection	<input type="checkbox"/>				
Biodiversity preservation	<input type="checkbox"/>				
Increase of profit/farm income	<input type="checkbox"/>				
Minimization of input costs	<input type="checkbox"/>				
Effective strategy planning	<input type="checkbox"/>				
Effective operational management	<input type="checkbox"/>				
Financial assessment/reporting	<input type="checkbox"/>				
Task scheduling/time management	<input type="checkbox"/>				
Labor saving/limit stress/increase farmers leisure time	<input type="checkbox"/>				
Limit human exposure to chemicals	<input type="checkbox"/>				
Limit the number or severity of human injuries	<input type="checkbox"/>				
Compliance records management	<input type="checkbox"/>				
Effective operational management	<input type="checkbox"/>				
Better interaction between advisor and farmer	<input type="checkbox"/>				
Control of animal health problems	<input type="checkbox"/>				
Better interaction between advisor and farmer	<input type="checkbox"/>				
Enhanced adaption and resilience to climate change	<input type="checkbox"/>				

13. For each of the following statements concerning digital advisory tools and services (DATS) please indicate the extent to which you agree or disagree.
(1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

	1	2	3	4	5
Using DATS in my work as an advisor is important	<input type="checkbox"/>				
The valued added by DATS to my advisory services is clear	<input type="checkbox"/>				
I don't know what DATS exist and how I could use them in my field of advisory services	<input type="checkbox"/>				

There are incentives/supports in place from my management/organisation to use DATS	<input type="checkbox"/>				
Other advisors influence me in my decision to use DATS	<input type="checkbox"/>				
I am confident in my ability to use DATS correctly	<input type="checkbox"/>				
Most DATS are user friendly	<input type="checkbox"/>				
The investment cost for DATS (i.e. capital costs, training costs, on-going costs) is high	<input type="checkbox"/>				
Existing DATS are mostly compatible with one another	<input type="checkbox"/>				
Raw data for DATS is accessible	<input type="checkbox"/>				
My organisation adheres to data privacy regulations like GDPR	<input type="checkbox"/>				
My organisation adheres to proper data security	<input type="checkbox"/>				
My organisation adheres to proper data management (data ownership and sharing)	<input type="checkbox"/>				
My organisation adheres to proper data storage	<input type="checkbox"/>				

14. For each of the following statements concerning digital advisory tools and services (DATS) please indicate the extent to which you agree or disagree.
(1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree, 5 – strongly agree).

	1	2	3	4	5
The use of digital tools by farmers in farm management is beneficial	<input type="checkbox"/>				
Farmers have the necessary digital competences to use DATS	<input type="checkbox"/>				
Face-to-face advice to farmers is important even if a digital advisory tool is available to perform the service	<input type="checkbox"/>				
Farmers trust that their data is being used appropriately by DATS	<input type="checkbox"/>				

iii. Part C – Digital advisory tools and services utilized

15. What types of digital tools and services (DATS) do you use?

Standalone applications (Software installed on your computer)	<input type="checkbox"/>	Web-based/Cloud-based applications (e.g. Facebook)	<input type="checkbox"/>
Client server applications (e.g. E-Mail client, WhatsApp)	<input type="checkbox"/>	Mobile apps	<input type="checkbox"/>
Spreadsheets (e.g. MS Excel)	<input type="checkbox"/>	Others (please specify): _____	<input type="checkbox"/>

16. If you use digital advisory tools and services (DATS), which do you find the most useful?
(If applicable please name the 3 most useful tools for you)

Tool 1: _____

Tool 2: _____

Tool 3: _____

17. Please provide the following information about the most useful tools (if applicable):

Tool	Tool 1	Tool 2	Tool 3
Source where you obtained the tool			
Why do you consider the tool useful			
How long have you used the tool (in years)			

18. Where did you get information about these tools? (Multiple selection possible)

Fairs, agriculture events and shows	<input type="checkbox"/>	Advisors Networks (EUFRAS, IALB, ...)	<input type="checkbox"/>
Training events or conferences	<input type="checkbox"/>	Ministry of Agriculture/ Chamber of Agriculture or other public institution	<input type="checkbox"/>
Farmers' union/ Farmers' association	<input type="checkbox"/>	Research institutions	<input type="checkbox"/>
Farmers	<input type="checkbox"/>	Agri-input/tech supplier	<input type="checkbox"/>
Other farm advisors	<input type="checkbox"/>	Internet	<input type="checkbox"/>
From the organization I currently work for	<input type="checkbox"/>	Other	<input type="checkbox"/>

19. Where do you get the data from which you use in your digital advisory tools and services (DATS)? (Multiple selection possible)

Manual input	<input type="checkbox"/>
Technical third party services (i.e. satellite services, weather services)	<input type="checkbox"/>
IoT (Internet of Things) installed devices (i.e. sensors, probes, GPS, camera)	<input type="checkbox"/>
Administrative third party services (i.e. CAP data, fiscal data, transaction data)	<input type="checkbox"/>

20. [Only if "IoT" was chosen in Q20): Which data do you use? (Multiple selection possible)

Sensor data	<input type="checkbox"/>
Barcode/QRcode data	<input type="checkbox"/>
RFID (radio frequency identification) data (e.g. for identification of livestock, tracking of agricultural products across the supply chain)	<input type="checkbox"/>
Others (please specify): _____	<input type="checkbox"/>

iv. Part D – Digital advisory tools and services training

21. Please rank the **5 areas** you feel you need training and knowledge (1 being most needed, 2 being the second most needed etc.)

Please rank 1-5	
Using online meeting technologies (i.e. software for webinars, online meetings etc.)	
Creating blended learning content (i.e. webinars, online courses, farminars)	
Methodological support in farm advisory services when using new technologies (e.g. farm advisory via whats app, chats etc.)	
Compliance and data protection regulations in online farm advisory services	
Creating online information material (general)	
How to realise online applications for subsidies	
Database search for specialised information	

Data acquisition knowledge (how and where to get the data)	
Data processing knowledge storage and use (e.g. Excel)	
Data visualisation knowledge (how to present and communicate the relevant findings)	
Data analytics knowledge (e.g. statistics, relationships)	

22. Please rank your **3 most preferred methods** to receive information and training about DATS (1 being your favourite, 2 being your second favourite, and 3 the least favourite).

Please rank 1-3	
Blogs	
Written documentation (handbooks)	
Video tutorials	
Online training	
Webinars	
Face-to-face interaction	