



**SMART
AGRI
HUBS**

D3.8 SUCCESS STORIES FROM IES – V2

WP 3

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BioSense Institute



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LIST OF ABBREVIATIONS

Abbreviation	Explanation
API	Application Programming Interface
CC	Competence Centres
CO2	Carbon Dioxide
DIH	Digital Innovation Hub
DMP	Data Management Plan
IE	Innovation Experiment
IOF2020	Internet of Food and Farm
IOT	Internet of Things
IOS	International Organisation for standardisation
IP	Innovation Portal
IPR	Intellectual Property Rights
FIE	Flagship Innovation Experiment
F2F	Face to face
GIS	Geographic Innovation System
GDPR	General Data Protection Regulation
GHG	Greenhouse gases
KPIs	Key Performance Indicators
LPID	Land Parcel Identification System
MVP	Minimum Viable Product
NGO	Non-governmental organisation
NPPL	National Smart Farming Pilot Project
RC	Regional Cluster
RDI	Research, development, and Innovation
SAH	SmartAgriHubs
SMEs	Small and Medium-Sized Enterprises
TRL	Technology Readiness Level
WP	Work Package

LIST OF FIGURES

Figure 1 Overview of developed services within SERVICE OC	22
Figure 2 Overview of improved services within SERVICE OC	23

LIST OF TABLES

Table 1 Maturity assessment of EXPAND projects	16
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TABLE OF CONTENTS

- PROJECT SUMMARY** **6**
- EXECUTIVE SUMMARY** **7**
- 1. INTRODUCTION** **8**
- 2. APPROACH & METHODOLOGY** **8**
 - 2.1 PROVISION OF DIHS FEEDBACK 9
- 3. RESULTS** **9**
 - 3.1 FLAGSHIP INNOVATION EXPERIMENTS AND DIHS 9
 - 3.2 FIE SUCCESS STORIES M37-48 12
 - 3.3 OC PROJECTS 13
 - 3.3.1 OC EXPAND 13
 - 3.3.2 OC RESTART 20
 - 3.3.3 OC PREPARE 21
 - 3.3.4 OC SERVICE 21
 - 3.2.5 RESTART FOR DIHS AND RESTART FOR SMES 23
- 4. CONCLUSIONS** **27**
- 5. ANNEXES** **28**

PROJECT SUMMARY

Digital technologies enable a transformation into data-driven, intelligent, agile and autonomous farm operations, and are generally considered as a key to address the grand challenges for agriculture. Recent initiatives showed the eagerness of the sector to seize the opportunities offered by ICT and in particular data-oriented technologies. However, current available applications are still fragmented and mainly used by a small group of early adopters. Against this background, SmartAgriHubs (SAH) has the potential to be a real game changer in the adoption of digital solutions by the farming sector.

SAH will leverage, strengthen and connect local DIHs and numerous Competence Centres (CCs) throughout Europe. The project already put together a large initial network of 140 DIHs by building on its existing projects and ecosystems such as Internet of Food and Farm (IoF2020). All DIHs are aligned with 9 regional clusters, which are led by organizations that are closely related to national or regional digitization initiatives and funds. DIHs will be empowered and supported in their development, to be able to carry out high-performance Innovation Experiments (IEs). SAH already identified 28 Flagship Innovation Experiments (FIEs), which are examples of outstanding, innovative and successful IEs, where ideas, concepts and prototypes are further developed and introduced into the market.

SAH uses a multi-actor approach based on a vast network of start-ups, SMEs, business and service providers, technology experts and end-users. End-users from the agri-food sector are at the heart of the project and the driving force of the digital transformation.

Led by the Wageningen University and Research (WUR), SAH consists of a pan-European consortium of over 160 Partners representing all EU Member States. SAH is part of Horizon2020 and is supported by the European Commission with a budget of €20 million.

EXECUTIVE SUMMARY

This report is the second iteration of the Success stories from Innovation Experiments (IEs) deliverable, delivered in M48, while the previous version of the report was produced in M36. This deliverable presents identified success stories, best practices and lessons learned across the project, including Flagship Innovation Experiments (FIEs), and a number of IEs, across the project's Open Calls (OCs). The methodology applied as part of the previous reporting period was put in place for the last iteration of the report, allowing the identification of success stories, best practices and lessons learned:

- By regular communication with FIEs and IEs during WP3 monthly Regional Cluster (RC) meetings
- By analysing the progress reports delivered by FIEs, IEs
- By one-on-one meetings with the project partners.

In that sense, WP3 was a linking point between FIEs and IEs, enabling and encouraging them to interact, share their experiences and learn from each other.

Looking at the structure of the success stories, best practices, and lessons learned they are classified as technological and non-technological but also depend on the OC's nature since each of the OCs had different objectives. The content presented within the report is structured to address success stories arising from Digital Innovation Hubs (DIHs) collaborations with FIEs, and by OC's implemented during the subject reporting period – EXPAND, RESTART, PREPARE, SERVICE. In addition to examining OC projects from the third reporting period, the report outlines the sustainability elements of the project finalised as part of the second reporting period, namely RESPOND for SME and RESPOND for DIH.

Content overview

Chapter 1 provides introductory remarks placing the reader in the report context, in line with the project objectives.

Chapter 2 describes the methodological framework applied

Chapter 3 presents some of the results, namely in collaboration with DIHs. The chapter also includes FIE success stories, an overview of the OC projects and best practices arising from a number DIHs, with a more detailed overview placed on provided services (namely within EXPAND and SERVICE OC).

Chapter 4 outlines conclusions.

Chapter 5 presents annexes.

The third reporting period was characterised by a high number of OC projects, namely DIHs working on the provision of services; therefore, the focus of the report is orientated towards provided services, enabling DIHs to improve their support to the ecosystem.

In addition, to the services provided, a large volume of operational and technical success stories and best practices were detected. Those are all presented in the Annexes of this report if the reader wishes to learn more about each specific case.

The report includes a wealth of information due to a large number of collaborations, while more details about each OC and specific projects are presented as part of D3.4-3. Activities from FIEs and IE related to the market take-up are presented as part of D3.7-2.

1. INTRODUCTION

The focus of the SAH project is on developing and supporting Agricultural DIHs. DIHs are supporting digitizing farmers and agricultural communities at the local level by offering a variety of services (technical, business, funding, ecosystem). In the SAH project, IEs have a specific function related to develop the DIHs. In each IE at least one DIH is involved to provide one or more services. Apart from the IE objectives in terms of developing innovative digital applications, the most important SAH objective is to develop, test and apply DIH services.

Analysing the IEs, one can see a lot of lessons learned and progress made in the IEs, but also quite some actions and results that are missing or could be improved. As most of the SAH partners, we surely see the shortcomings in supporting the IEs regarding technical issues, business development, user involvement and ecosystem involvement. The SAH project is designed in a way that IE support will be provided by DIHs and not by the WPs. Interaction with IEs in SAH is indirect by providing support to DIHs that support the IEs. For direct support and collecting specific details in the IEs there is no capacity reserved in the WPs for supporting the 76 IEs. A lesson learned from the SAH is that we overestimated the capacity and maturity of the DIHs, but we could observe improved DIH capacities during the third reporting period and flowing the assessment of DIHs as received from RCs. OC projects were surely a good mechanism form improving and building DIHs services. Nevertheless, more work should be done on improving DIHs skills and competences for the provision of full support on all kind of issues that IEs need support on.

We learned that regarding the role of the DIHs, our view at the beginning of the project was overly optimistic. Now, with a more realistic view, we must recognise that most DIHs need to develop and mature the different supporting services, and we could say that this has been initiated.

2. APPROACH & METHODOLOGY

As with the first and second reporting period, WP3 continued with the implementation of previously established methodological approaches enabling proper monitoring and evaluation of IEs, as envisaged under the Grant Agreement. The identification of best practices and success stories is one of the tasks of WP3, which was executed through:

1. RC monthly meetings with FIEs, IEs, and RCs,
2. Regular periodic reporting and data collection,
3. One-on-one meetings with FIEs and RCs, based on individual needs,
4. Feedback collection from DIHs,
5. Collection of additional information from the OC projects that are finalised during the second reporting period.

The established and executed approach allowed prompt reactions from the WP3 team and the project as a whole, where and when needed, and regular interactions with FIEs and RCs.

RC monthly meetings

Meetings were obligatory for RC leaders and co-leaders and ongoing FIEs. OC IEs were invited to join on a voluntary basis as their implementation timeline was rather short. Regardless of that, most IEs attended monthly meetings on a regular basis as they saw them as an opportunity to connect with other actors from the region and learn about other projects and their experiences.

Regular periodic reporting and data collection

In relation to best practices and success stories, periodic reporting was also a valuable tool for capturing these elements on a periodic basis. The third reporting period was characterised by a large number of OC projects, enriching a portfolio of learning experiences and best practices. Progress report questionnaires were created for each of the open calls, capturing their specificities.

Feedback collection from DIHs

During the third reporting period, WP3 also reached out to DIHs working under FIEs to collect their feedback on the collaboration with FIEs. This was the first time that direct contact was established with DIHs for the purpose of feedback collection regarding their collaboration with FIEs.

Collection of additional information from the OC projects

A set of additional questions was distributed to OC projects that have ended during the second reporting period allowing SAH to capture development that has happened in the meantime, such as the status of the developed solution, additional funding, etc.

The content of this report is a valuable source of information for future innovation experiments and DIHs.

2.1 PROVISION OF DIHS FEEDBACK

As previously mentioned, the collaboration between DIHs and FIEs was captured within the third reporting period as well. The direct provision of feedback from DIHs was put in place to allow the project to learn directly from the DIHs participating in the implementation of FIEs.

Upon the finalisation of FIE progress reports, WP3 compiled a new report based on what FIEs communicated regarding their collaboration with the DIHs. This new report in the form of a template was sent to DIHs and they were asked to provide us with their feedback on performed activities and on the overall collaboration with the FIEs. This exercise was targeting 28 initial FIEs and 60 participating DIHs. The feedback was received from 26 DIHs from 19 FIEs. Two of the FIEs ended at the end of October 2022, enabling the team to reach out to their seven participating DIHs and collect feedback. Finally, DIHs from seven FIEs never responded to the WP3 request for the feedback provision and were perceived as DIHs with low activity levels.

Once the feedback was collected, WP3 proceeded with the analysis of responses presented within D3.4-3. An example of a good collaborative approach and a diverse provision of services between a FIE and DIHs is presented within Chapter 3.1 - Flagship Innovation Experiments and DIHs.

3. RESULTS

This chapter presents project results related to best practices and success stories arising from FIE and DIH collaborations and includes identified lessons learned and best practices from the OC projects. For easier navigation through different the OCs and belonging projects, please see Annex 1, outlining each OC and the projects within including the timeline and the sector they belong to.

3.1 FLAGSHIP INNOVATION EXPERIMENTS AND DIHS

In M37-M48, the project analysed identified good practices concerning DIH and FIE collaboration. The case below presents a good example of such collaboration.

Collaboration between **FIE6 AgriFarmLab** coordinated by Infagri85 and the Chamber of Agriculture Pays DIH de la Loire. The following DIHs took part in FIE6 implementation:

- DIH VEGEPOLYS-VALLEY,
- DIH Images & Réseaux, DIH CEATech,
- DIH Chambre d'Agriculture des Pays de Loire.

This concrete example demonstrates how FIE can be utilised as a tool for the development of DIH services. This particular collaboration strengthened the partnership, and the parties will continue to collaborate in the future, beyond SAH.

Within the collaboration process, the DIHs also **benefited** from mutual connections and collaboration within the SAH. For the DIHs, this experience ensured higher national and European visibility, better efficiency for further collaboration with the partners from the FIE and allowed them to integrate within SAH network.

Services offered to FIE by DIHs

This particular example demonstrates a wide range of services provided by the DIHs, including ecosystem services, business related services and services associated with skills and development. The example is presented in a form of storytelling to demonstrate the full scope of learning and development processes.

Activity 1 – Writing the call for SMEs application and its juridical rules:

- Broadcasting the call for application in their networks
- Communicating in events about the call for applications

Within this activity, DIH **VEGEPOLYS-VALLEY** was able to provide support due to their:

- Knowledge of the problems and needs of the agricultural sector on the territory
- Capacity to elaborate a proper message for stakeholders coming from another sector of activity
- Ability to disseminate a call for solution in a large ecosystem related to innovation (capacity to mobilise the innovation ecosystem to reach the targets).

While other partners were less competent regarding the juridic aspects, **DIH VEGEPOLYS VALLEY** provided the example of the established rules from its start-up contests to build the one for this specific call.

DIH Chambre d'Agriculture des Pays de Loire acknowledged the significance of the DIHs participating in a mutual activity, allowing them to get to know each other better and share their working mechanisms towards the service provision, which is perceived as an important first step for the overall success of the project.

Activity 2 - SME selection process:

- Determination of the relevant criteria for the first step of the selection, performed by the five partners
- Contributing to settling a committee for the second step of the selection
- Helping the applicant SMEs to prepare for the third step of the selection
- Implementing the day when this selection took place.

As noted by the DIH, a real differentiating point was the involvement of producers in the selection of the candidates. For the team, mobilisation of SMEs was not an easy task, as the solutions were addressing various agricultural sectors. The presence of the DIH in the activity permitted, due to their knowledge of the local network of producers, to focus on those SMEs that were able to join the dynamic. The cross-sectorial competences of the partners were relevant to evaluate the candidates on a 360° approach for the first selection step. **This kind of collaboration can be a lever for upskilling the different partners, especially regarding digital aspects.**

DIH Chambre d'Agriculture des Pays de Loire perceived this activity as crucial since the team was able to move towards more operational implementation due to the applied start-

ups. The collaboration was perceived as very rich in terms human and technological discoveries.

Activity 3 - Testing of SME

Experience within this process will help **DIH VEGEPOLYS VALLEY** to better articulate the contribution of the competence centres in future projects on this topic.

The activity allowed **DIH Chambre d'Agriculture des Pays de Loire** to form a group of farmers and to put farmers and start-ups to work together and exchange knowledge.

Activity 4 - Evaluation process

Within the evaluation process, communication-related activities were performed by **DIH VEGEPOLYS VALLEY** within their network.

DIH Chambre d'Agriculture des Pays de Loire learned about the importance of communication, by adapting communication to different audiences and widely disseminating the initiative.

Input to reusable components of the FIE

Technological reusable component "Agri FarmLab system of accompaniment." The methodology developed was relevant in helping to connect technology providers with users during the innovation process. In this respect, a DIH needs to understand agricultural problems and digital issues at the same time. The combination of these competences is perceived as a key factor for good support.

Support was provided within **non-technological** components as well:

- Building the network: the DIH was able to provide support in the identification of solution providers and representatives of potential users (matchmaking) and cross-sectorial communication
- Event management.

Based on the experience gained within the process, the DIH **VEGEPOLYS VALLEY** is interested in sharing the methodology with its whole network in the upcoming years.

DIH Chambre d'Agriculture des Pays de Loire previously worked on innovative solutions, but this was the first time for them to apply the collaborative approach. The DIH strongly believes that collective management and collaborative process applied within FIE6 can be replicated in innovation experiments and future collaborations. The DIH benefited from shared knowledge, skills, broadening the spectrum of people, and economies of scale were made possible by the project.

Services to be strengthened in the future

DIH VEGEPOLYS VALLEY would like to strengthen in the future aspects related to the identification of specific needs of plant producers on an annual basis and the establishment of a specific animation process aiming to involve more producers and their representatives in the DIH.

DIH Chambre d'Agriculture des Pays de Loire – The establishment of regular times for the uncovering of innovative solutions between employees, farmers and companies, including regular informal discussions. The DIH plans to establish an open lab within the company.

DIH Inf'agri 85 noted that the experience helped them to improve the quality of their services related to networking and management. The DIH is planning to develop new services related to broadcasting innovations, communication and introduction to the market as well as services related to funding.

Best practices identified by DIHs

- The mutual desire for exchanges and discoveries between start-ups and farmers
- Advances in the products and services of supported companies
- The market entry of the supported SMEs
- The launch of a new working group in 2022 related to one of the supported SME, leading to a potential innovative project
- Development of 5 SMEs in collaboration with the farmers.

"Alone we go faster, together we go further!" - DIH Chambre d'Agriculture des Pays de Loire

3.2 FIE SUCCESS STORIES M37-48

Within the second reporting period, 15 FIEs have ended, thus 13 FIEs were implemented as part of the third reporting period - FIEs: 1, 2, 3, 7, 9, 11, 12, 12, 14, 15, 17, 18 and 21. Also, the majority of those FIEs ended within several months from the start of the third reporting period, and therefore, the best practices and success stories arising from FIEs in M37-M48 were not so extensive. Identified success stories, best practices and lessons learned from these experiments are outlined in Annex 2, including overall success stories and those related to the third reporting period. In addition, some of the examples regarding achieved impact beyond SAH are presented below.

FIE 1 – Farm Sustainability Audit

The FIE's overall success is related to the discussion with farmers and industry partners about the project and receiving feedback. The farmers were very open minded about improving their sustainability on the farm, and through this project, they saw an opportunity to be the leaders of the Irish dairy industry by being able to effectively reduce their carbon footprint by identifying practices that are good and bad on their own farm. The industry was also very enthusiastic about the project. The national farm survey was interested in collaborating with the team, at the end of this project, and re-using some of the processes that were put in place by the FIE for streamlining the auditing process and labour requirements. There is an ongoing discussion on how to integrate knowledge gained from this FIE, alongside other projects, to create a sustainability assessment for all dairy farmers in Ireland.

Discussions with FIE2 (Sustainability Tool for Remote Assessment and Management of Farmland - STREAM) were made with a positive outcome regarding integration of the FIE2 outputs into the sustainability platform of FIE1, which will allow farmers to gain further knowledge on the biodiversity status of their farm and see how this also compares to other farmers.

The SAH Innovation Portal (IP) also presents some of the identified lessons learned, success stories and best practices throughout the SAH:

[How FIE1 reached out to the farmers and secured them for both FIE projects](#)

[How FIE 1 supported the partner and the farmers to secure the equipment onto the farms](#)

The following two FIEs reflected on the solution's unpredicted positive impact and lessons learned within the process:

FIE11 – Pig Health Assessment Based on Applied Sensors – Smart Pig Health

In collaboration with the farmers, FIE11 was able to apply the digital technology and witness additional benefits that the technology brought to the farm, namely providing information to the farmers of which they were previously unaware. The information provided hints and showed the farmer the need for action.

FIE11 applied a holistic approach to increasing pig health, as well as reducing antibiotic use and antimicrobial resistance (AMR). Using stable climate and management data, an AI-based forecast model was developed to predict the health status of pigs and mal-conditions. The predictive model provided farmers and veterinarians with timely information that measures to promote pig health can be taken before the pigs are sick. For monitoring purposes, a set of sensors had been installed to gather information on temperature, humidity, luminosity, water consumption as well as NH₃ and CO₂ concentration in a 24/7 environment. Management data had been reported like applied treatments, the number of pigs at the beginning of the fattening period and the end as well as changes in the number of pigs. The veterinarians assessed the clinical health status of the pigs every other day. The FIE approach resulted in an improvement in the skills of all partners involved in the project. On the one hand, skills in dealing with digital technologies were improved during the work to achieve the FIE-specific goals. On the other hand, new knowledge was gained as an outcome of the intervention, perceived as an added value from the project.

Namely:

- Additional skills were created as part of the production process, including dissemination of the knowledge about applied digital technology and its maintenance, allowing farmers to operate the technology more sufficiently.
- Additional value information was created based on digitalisation (sensors providing additional information, temperature affecting respiratory diseases and feed intake, reduced water consumption can point to an illness or issue with a water supply, impact on health caused by low humidity, impact on the health of a high CO₂ concentration, ammonia affecting the respiratory system leading to irritations and damages, etc.)

This example demonstrates added values of the experiment, but it is also a good example of farmer-related collaboration, demonstrating their openness and interest in learning and adapting to the new environment.

FIE13 - Ammonia Emission Monitoring Network - AEMON

The nodes applied within the FIE have accumulated interest outside of the SAH project, as the current issues on nitrogen pollution due to agriculture have pushed the topic higher on the political agenda. If the current FIE system can be improved further, this can be a future way for farmers to improve decisions, where their tacit knowledge is no longer sufficient, as well as to enable farmers when making efforts in reducing emissions. While the integration of the different components is more limited than expected, the FIE demonstrated that a smart barn climate control system, that also takes emissions into account, is certainly possible in the future.

More examples of best practices and lessons learned captured by the project can be found on Innovation Portal, section "Lessons."

3.3 OC PROJECTS

This chapter presents some of the best practices and success stories arising from the OC projects finalised within the third reporting period, namely EXPAND, RESTART, PREPARE and SERVICE. The analysis of additional questions from RESPOND for SMEs and RESPOND is presented below, as well.

3.3.1 OC EXPAND

Throughout the EXPAND OC, support was provided to projects that are proposing initiatives of DIHs supporting the digital innovation in their region and facilitating the set-up and realisation of IEs, equipped with own investments, and supported by additional public and/or private funding. The funding that is provided by SAH is exclusively available for developing, maturing, and providing DIH innovation services.

Eleven projects were funded under this OC, 3/11 DIHs are also **eDIHs**.

The projects were asked to provide maturity assessments for DIHs as part of the application process and later once the project was over.

OVERALL

9/11 projects stated that other **opportunities** have arisen from partnering **collaborations** established within the SAH project:

- Organisations that have joined a DIH as new partners are now exploring collaborative approaches in Research and Development calls at regional, national and European levels. (EXPAND 1, EXPAND 3, EXPAND 11)
- New discussions started towards involving the overall Belgian Potato industry organisation and WatchITgrow in the innovation experiment. (EXPAND 2)
- Mutual preparation of Food Safety Standards for B2B Hubs submitted to the Belgian Federal Minister Clarinval for discussion. (EXPAND 4).
- The project is continued in collaboration with farms, for the further development of IEs. Hub4Everybody is now commercially installed in the Liberec region. (EXPAND 6)
- Discussions on applying technology developed within SAH within Flemish SME performing roadside maintenance and developing a lot of custom machinery for their operations. The company contacted IE organisation, after reading articles published on SAH and organisation website and other dissemination channels (EXPAND 7)
- Mutual promotion and consolidation of services and after SAH – with all the technology companies involved in testing the OIP services, a dialogue was opened for other operative collaborations. Relationships with the participating organisations were strengthened, resulting in the preparation of join matchmaking and training initiatives. (EXPAND 8).
- Collaboration with the City of Antwerp on empowering the retailers and producers that are part of De Voedselstrategie and Rurant. (EXPAND 9).

Solutions from five EXPAND projects are already **on the market** - EXPAND: 3, 4, 5, 7 and 10. Also, 7/11 projects received **additional funding** for the continuation of their work, including national, regional and European funding.

Lessons learned, best practices and success stories arising from each EXPAND project are presented in Annex 3.

MATURITY ASSESSMENT

11 DIH from this OC worked on the improvement/development of 121 services in total. Divided by categories:

- Technology 33 services
- Training, skills and education 28 services
- Business 26 services
- Ecosystem 22 services

DIHs were asked to assess the readiness of their DIH by running the Maturity Assessment tool available via the IP, at the proposal submission stage and as part of the final progress report. This way the SAH project team was able to analyse and compare the development of the DIH during the project and detect improvement of the DIH as a result of their participation within SAH.

Maturity assessment tool:

- Identifies and records the current maturity level of DIH
- Identifies and records the current service offering of DIH
- Identifies DIHs' strengths and weaknesses
- Detects elements for the improvement
- Finds tailor-made learning material based on the DIH's actual needs, that will help the DIH to evolve

- Provides valuable customised support from the SAHs Network with external (peer) review of the DIH's overall offering
- Grows the overall maturity of the DIH over time.

The tool is assessing the following maturity levels of the DIH:

- General DIH maturity (Governance, DIH experience, DIH Business plan, DIH Income Generation, Customers/paying members, Ecosystem, Infrastructure, Strategic RDI Technology field)
- TRL levels
- Maturity levels per service (Ecosystem, technology development, Business)
- Maturity level per pillar (Ecosystem, technology, business)
- DIH overall maturity.

Based on the scores, the DIH receives a numerical score and descriptive assessments ranging from 1-5:

1. Ad-Hock
2. Low
3. Intermediate
4. High
5. Excellent

The table below demonstrates one portion of the maturity assessment analysis, showing their overall maturity assessment before they participated in the EXPAND OC and once the project was finalised, and includes an overview of the maturity of services - ecosystem, technology, and business.

Project No.	Assessment before/After SAH	Overall DIH maturity	Ecosystem	Technology	Business	Overall Maturity level
EXPAND 1						
DIH IoT	Before SAH	3.93	4.5	4	3.8	High
	After SAH	4.31	5	5	4.4	Excellent
EXPAND 2						
OYDS	DIH did not provide a complete maturity assessment at the proposal submission stage. DIH overall maturity grew however based on submitted maturity assessment, it is not possible to provide a more detailed analysis. Please see the narrative inputs below the table.					
	After SAH	3.04	3	1.67	4	High
EXPAND 3						
EquiHub	DIH did not provide a complete maturity assessment at the proposal submission stage. DIH overall maturity grew however based on submitted maturity assessment at the end of the project, it is not possible to distinguish improvements based on predefined categories as within this table. See the narrative explanation below the table for more information.					
EXPAND 4						
Linked.Farm	Before SAH	2.37	2.5	2	2.22	Intermediate
	After SAH	4.27	4.75	4.25	4.5	Excellent
EXPAND 5						
AgriFood Lithuania DIH	Before SAH	3.35	3.5	3.25	3.5	High
	After SAH	3.59				
SE Finland Uni. of Applied Sci.	Before SAH	3.56	3.67	3.2	3.5	High
	After SAH					
Agrifood Croatia	Before SAH	2.44	2	3	3.33	Intermediate
	After SAH	3.06				High
EXPAND 6						
ADDSEN	Before SAH	3.21	3.67	2.33	3.5	High

	After SAH	3.51	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	
AGCO GmbH	Before SAH	2.67	3.67	3	3.67	Intermediate
	After SAH	N/A	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	
Agri. Asso. of the CR	Before SAH	4.67	4.75	0	4.33	Excellent
	After SAH	4.73	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	
Czech Center for Science and Society	Before SAH	4	3	3	3.67	Excellent
	After SAH	4.67	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	Excellent
CzechInno Association of Legal Entities	Before SAH	3.55	4.25	3	3.6	High
	After SAH	3.85	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	
Plan4all	Before SAH	3.52	3.37	3	4.33	High
	After SAH	3.79	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	High
Technical Uni. of Kosice	Before SAH	3.21	2.75	3.33	3.75	High
	After SAH	3.43	Increase detected, see text below	NA	NA	
Slovenská Poľnohospodárska Univerzita v Nitre	Before SAH	2.04	1	2	3	Intermediate
	After SAH	2.61	Increase detected, see text below	Increase detected, see text below	Increase detected, see text below	
EXPAND 7						
Kapernikov	Before SAH	4.04	4	4.2	3.33	Excellent
	After SAH	increase	NA	Increase detected	NA	
EXPAND 8						
Innovacoop	Before SAH	2.66	3	2.6	3.2	Intermediate
	After SAH	3.16	3.5	3.25	2.5	High
EXPAND 9						
Equihub UG	Before SAH	3.22	3.25	2.75	3	High
	After SAH	3.75	NA	3	3.02	
EXPAND 10						
Ant Robotics GmbH	Before SAH	3.13	3.5	3.25	3.2	High
	After SAH	3.3	Increase detected	Increase detected	Increase detected	
EXPAND 11						
TASTEFEVER	This DIH did not provide the maturity assessment at the proposal submission stage, not a maturity assessment overview at the end of the project to allow such analysis					

Table 1 Maturity assessment of EXPAND projects

IoT DIH from EXPAND 1 achieved maturity improvements on all levels, upscaling the overall maturity from High to Excellent. The biggest change is detected within the provision of technology services, following business and ecosystem.

DIH OYDS from EXPAND 2 was established under the umbrella of SAH, meaning that their services were established/improved during the SAH implementation. This DIH is two years old and plans to develop further with the assistance of European funds. A complete maturity assessment was not provided at the beginning of the project making it difficult to draft any comparisons based on the actual data. The DIH coordinator noted that during the SAH project, the DIH grew in financial and human resources, now able to provide more technological advice. The ecosystem service is currently the strongest service of the DIH.

EquiHub from EXPAND 3 has gained more maturity in the fields of income generation, promotion and also technical support. Their network expanded into the fields of finance. They have started to build up a business angel community. The Platform service has increased. The DIH was able to provide a solution which teams can use, which helps them to focus, and which also helps DIH to support the teams, match resources and focus on the needs of the teams. Furthermore, the Train the Trainer Program enabled DIH to reach new target groups, as the DIH was not only focusing on the innovators or founders of technologies but also on the DIH and Competence Centres, which also allowed the ecosystem service to grow.

DIH Linked.Farm from EXPAND 4 evolved from intermediate overall maturity score to excellent. The services provided by the DIH improved significantly in terms of quality and quantity. Regarding services, overall, the score improved from 3.25 to 4.5. In all services (business, technology, ecosystem), the scores improved. The most significant changes have been made in the Ecosystem services (F2F hub meetings are now regularly organized by the DIH to exchange best practices and new technological features). The DIH gained a significant maturity improvement throughout the project, while the activities provided per services have not changed.

Three DIHs, from three countries, were involved in the implementation of **EXPAND 5**. The analysis of the maturity was provided in a narrative form by the DIHs.

- **DIH AFL** – DIH maturity before the SAH project was already established as high with a lot of well-improved services. The SAH project in general increased the DIH's maturity from 3.35 to 3.59. The increase accustomed by improved Business plans and technology fields services. Many services were improved by pillars, especially business plan related services, ecosystem, technology demonstration and finances.

Services – The most significant overall changes are seen in technology demonstration and business services, business plan development. The DIH obtained many new connections and a stronger ecosystem throughout the aquaculture sector within the scope of technology demonstration activities. People skills improved in performing the SAH project, especially those related to strategy creation and support.

- **DIH AFC** – The general maturity of the DIH after the implementation of the project increased from "Intermediate" to "High". Also, the average level according to services has increased to the "High" level due to the various tasks that the DIH performed within SAH. The DIH experienced the biggest increase in maturity according to pillars. By implementing the project, the DIH improved business organisation, human resources and finances.

Service – The DIH improved the "Management" category, its business model to meet the demand for services.

- **DIH XAMK** – The initial maturity assessment was done from the perspective of a well-established larger DIH/eDIH. From that perspective, the overall maturity has not notably changed. However, on a regional level, the DIH's capabilities to serve aquaculture stakeholders have notably increased. In particular, the DIH managed to

expand its offering with strategy development. Since the maturity of this new service is still low, the overall DIH maturity in the assessment shows negative progress.

Services – The most prominent improvements include better capabilities for:

- Building ecosystems
- Supporting collaborative innovation activities
- Matchmaking
- Commercial exploitation of Innovation Experiment (IE)
- Determining policy recommendation, based on IE
- International collaboration.

Eight DIHs participated within **EXPAND 6**.

- **ADDSEN DIH** overall maturity has increased from 3.21 (High) in 06/2021 to 3.51 (High).
Services - ADDSEN DIH services have increased from Intermediate to High. ADDSEN DIH Human resources for services (Community building, Strategy development, Technical support, Access to finance, Accelerator support) increased their maturity level from 2 to 4. Also, the processes were matured, from 2 to 3.
- **CzechInno DIH** overall maturity has increased from 3.55 (06/2021) into 3.85 (08/2022) and, thus, stayed on a high level.
Services - CzechInno DIH maturity level per service has increased from 3.65 (06/21) to 3.85 (08/2022) and stayed on level High.
- **AACR DIH** overall maturity have increased from 4.67 (Excellent) in 06/2021 to 4.73 (Excellent).
Services - AACR DIH maturity levels per service has increased from 4.57 (Excellent) in 06/2021 to 4.63 (Excellent) in 07/2022.
- **AGCO DIH** general DIH maturity has increased from 4.11 in 06/2021 to 4.44 (Excellent).
Services - AGCO DIH Maturity levels per service Overall Score at 3.77 High in 06/2021, same as in 07/2022
- **TUKE DIH** increased overall maturity to 3.43 for 7/2022. Improvements were in technology fields, improved business plans but also in incubator and accelerator support due to strategic enhancements within Ulysseus Alliance. Improvements due to Agrihub were in community building, new technology field and improvements of technology infrastructure by enhancing the data centre with accessible datasets for new start-up ideas and projects.
Services - TUKE DIH Unfortunately it was hard to precisely compare as the previous assessment was not printed out but also during the project DIH has formalised into the regular DIH structure with tuning some services, e.g., revisiting lower TRL levels or strategic RDI where TUKE plays higher role. Although DIH is a part of TUKE, the services and several fields of assessment criteria were restructured. Improvements were achieved in community building, although assessed only by intermediate. Other improvement visible especially in increasing contract research and project development together with strategy development all in line with activities within Ulysseus Alliance. The main improvement as a result of the Agrihub project is in community building, skills and education. Overall score was 3.43.
- **SUA DIH** The overall DIH Maturity has increased from 2.04 (Intermediate) to 2.61 (Intermediate) and in detail for 2022 reached the following score:
 - General DIH maturity Overall Score and Results 2.44 (Intermediate)
 - Maturity levels per service Overall Score and Results 2.8 (Intermediate)
 - Maturity levels per Pillar Overall Score and Results 2.6 (Intermediate)**Services - SUA DIH** Maturity levels per service increased from 2 (low) in 2021 and reached in total 2.8 (Intermediate) – 2.5 for Ecosystem and 3 for Technology development and Business services.
- **CCSS DIH** general DIH maturity has increased from 4 in 06/2021 to 4.67 (Excellent).
Services - CCSS DIH maturity level per service has increased from 3.25 (06/21) to 3.56 (07/22) and stayed at High level.

- **Plan4all DIH's** overall maturity has increased from 3.52 (High) in 06/2021 to 3.79 (High) in 07/2022.
Services - Plan4all DIH maturity level per service has increased from 3.75 (06/21) to 3.9 (07/22) and stayed on a high level.

Kapernikov DIH, EXPAND 7 – The general DIH maturity did not change compared to the beginning of the project. The DIH noted that the project was relatively short (nine months) and for this reason advancements were not detected in the maturity levels. Nevertheless, the DIH gained experience in typical agrifood challenges and was able to publish about this experience. The SAH OC project already led to talks with new prospects, allowing the DIH to bring the state of the art from one sector to other sectors. However, the maturity self-assessment does not make any distinction in application sectors, so this improvement is not reflected in the score.

Services – With the development of a low-entry AI platform/workflow for customers without extensive IT infrastructure knowledge, Kapernikov DIH slightly improved the technology development service, allowing better service provision to a wider range of customers. This new platform/workflow is already tested by one customer.

For **EXPAND 8 DIH Innovacoop**, maturity has risen from 2.66 to 3.16 due to SAH project and network. The services that have changed and improved are mainly all the services disbursed: Ecosystem and strategy development, Technology development in particular with contract research and testing and validation and finally Business services with the incubator/accelerator support. The overall Score results High and the maturity levels per service overall Score and results is high. the maturity levels per pillar overall score and results is intermediate and DIH overall maturity overall score and Results is 3.16 – High.

The maturity was improved in DIH's Business plan, Ecosystem, Infrastructure, Strategic RDI and the Technology fields. All projects and activities are promoted and undertaken under the umbrella name of the DIH.

Governance is based on the core partners involved from the start of the DIH initiative and follow a project-by-project approach. There is still no separate legal identity of the DIH.

DIH Equihub UG within EXPAND 9

The DIH achieved growth in the overall maturity from 3.22 to 3.75, while business and technology services were slightly increased, by 0.2 and 0.25.

EXPAND 10 DIH Ant Robotics GmbH

The overall maturity level of the DIH has risen from 3.13 to 3.3. The focus of the EXPAND stage was to build on the groundwork of the PREPARE stage and to implement a dedicated testing and validation scheme, upon a foundation of a much more enhanced operations capability due to improved infrastructure and production partners. The positive results of the project to reach TRL 8 speak for the success of this approach.

Further, the SAH project enabled the development of a more advanced business plan, by providing the functional basis for pilot testing and confirmation of the key product hypothesis: that a transport robot can provide a return on investment in terms of improved efficiency and labour cost savings (DIH Business Plan improved from 3 to 4). In addition, being able to set up a pilot production line to produce two transport robots at a TRL 8 improved the infrastructure and supply chain of Ant Robotics, which can now be transferred to pre-series operations and expansion (Infrastructure improved from 3 to 4).

DIH TASTEFEVER from EXPAND 11 did not provide a maturity assessment at the proposal submission stage, nor a maturity assessment overview at the end of the project to allow a comparative overview.

3.3.2 OC RESTART

RESTART was an OC for hackathon-type of activities that will contribute to the restart of the European Agri-Food Economy with short and medium-term impacts to mitigate the effects of the COVID-19 crisis. Under this OC, 7 projects were funded. 2/7 DIHs are also part of an **eDIH**. Services related to the implementation of Hackathon and challenges related activities were related to organisation of the events, communication, and dissemination activities, expanding the ecosystem, etc. For this reason, DIHs were not asked to assess their services during the project. For this reason, elements related to the winning solutions and sustainability of those projects were subject to RESTART OC projects.

Following the hackathons, each project, except RESTART 4, had a plan for following up on the winning solutions, mainly by:

- Organising meetings and calls with the winning teams,
- Visiting test sites,
- Creating preliminary roadmaps for further development of the teams,
- Identifying crucial partnerships,
- Reinforcing weak points from the evaluation and supporting the teams in final developments,
- Providing advice on how to apply to the different sources of funding,
- Providing mentors and experts to the teams,
- Applying previously developed monitoring methodology to monitor the teams.

All RESTART projects were provided with a set of additional questions to reflect on their support to the winning solutions after the end of SAH. In total, 5/7 project provided answers to additional questions, noting that all five continued to support winning solutions and after the end of the RESTART project in 2021 and the first half of 2022, by offering mostly business and ecosystem services.

Business:

- Creating a business model and a business plan - creating a financial plan - taking strategic decision - building and implementing an innovation and sustainability strategy - creating a marketing strategy - building networks and partnerships
- Mentoring sessions, helping with further progress
- Helping the winners in transforming their project into an EU project in the next LIFE program

Ecosystem:

- Consultative services, establishing connections with researchers and organisations operating in their field of work
- Mentoring sessions, helping with further progress

DIH coordinators were asked if, based on their experience, hackathons are a good methodological way to support innovative solutions.

All 5 DIHs responded that hackathons are a good methodological way of supporting innovation solutions.

- They allow an inter-disciplinary dialogue on challenges, addressing potential solutions from various viewpoints.
- The "pressure cooker" environment works well and is efficient. Things are being done faster and directly with the right stakeholders.
- A good way to disseminate the solutions and reach agreements between participants. The companies have been able to present their project and work together to find common solutions. Even if more funds are needed for finalising solutions development, the hackathon activities have been a good way to start and properly focus their efforts.
- Good methodological way to create social innovation as they permit the cooperation of various stakeholders. The participants are free to confront opinions and innovate while being guided by experts during the creative process. This can lead to the creation of innovative solutions ready to be applied with just some additional research and preparation.

- Hackathons can be a good methodological way to support innovative solutions, but within the context of the farmer community, the methodology and approach should be developed further and connected to their needs rather than applied as a standard approach. Farmer communities are known to require a more particular facilitation approach, as they tend to be more conservative as well as practical minded rather than innovation minded. RESTART 7 provided an example of such methodology as part of their deliverable No. 2.

All 5 DIHs are **planning to organise more hackathons** in the future, while:

- RESTART 4 DIH is organising StrikeTwo's 6th edition this year.
- RESTART 5 DIH is currently organizing a hackathon within the Interreg POCTEP HIBA project in cooperation between Spain and Portugal to support start-ups that face the challenges that are being presented currently. It will take place during 2022 and 2023.
- RESTART 6 DIH would like to further review the methodology and test it with a series of hackathons to have sufficient material to write down and distribute a guide on how to run a social hackathon mitigating its limits.

An overview of the plans of the DIHs, and the impact they have made beyond SAH including success stories and lessons learned are presented in Annex 4.

3.3.3 OC PREPARE

PREPARE OC was open to DIHs that are supporting operations in the planning and definition of IEs for digital transformation in the Agri-food sector, by preparing a proposal to be submitted to the EXPAND OC or other calls of this nature.

Within PREPARE OC, 15 projects were funded in total, 13 implemented in the third reporting period.

11/15 DIHs applied for additional funding with the proposal developed under PREPARE OC, including application to EXPAND OC (2 projects), SERVICE OC (2 projects), national funding (2 projects), H2020 and Horizon Europe (2 projects), and to other sources of funding (3 projects). At the time of the report preparation, seven projects were approved for funding, four were rejected, while results were pending for three projects. Seven DIHs confirmed that they do plan to apply for further calls with the results the PREPARE OC.

At the stage of the report preparation, 5/15 DIHs are also chosen as **eDIHs**.

Specific lessons learned arising from the PREPARE OC can be found within Annex 5.

3.3.4 OC SERVICE

SERVICE was an OC for projects realised by DIHs that aim at services for the support of digital transformation in the agri-food domain. Within the OC, projects shall develop, innovate, provide, validate and/or improve services provided by DIHs. Tangible innovation services shall be provided by DIHs. They should aim at supporting the set-up and realisation of digital innovation activities realised by stakeholders of agri-food communities and related networks.

A total of 22 projects were implemented within this OC. Services were provided through DIHs that were either working on the development of new services and applying them to IE or working on the improvement of existing services.

The 22 projects worked on approximately 207 services. Annex 7 provides an overview of developed services per each service category with the maturity levels before SAH and after SAH implementation.

Development of new services

Sixteen DIHs worked on the development of approximately 96 new services. Six DIHs did not develop new services but worked rather on improving their existing services only. The most services developed were related to the Business – 26 services, followed by the

Ecosystem and Technology, each 25 services. Thirteen services were developed within the scope of skills and training and seven related to education.

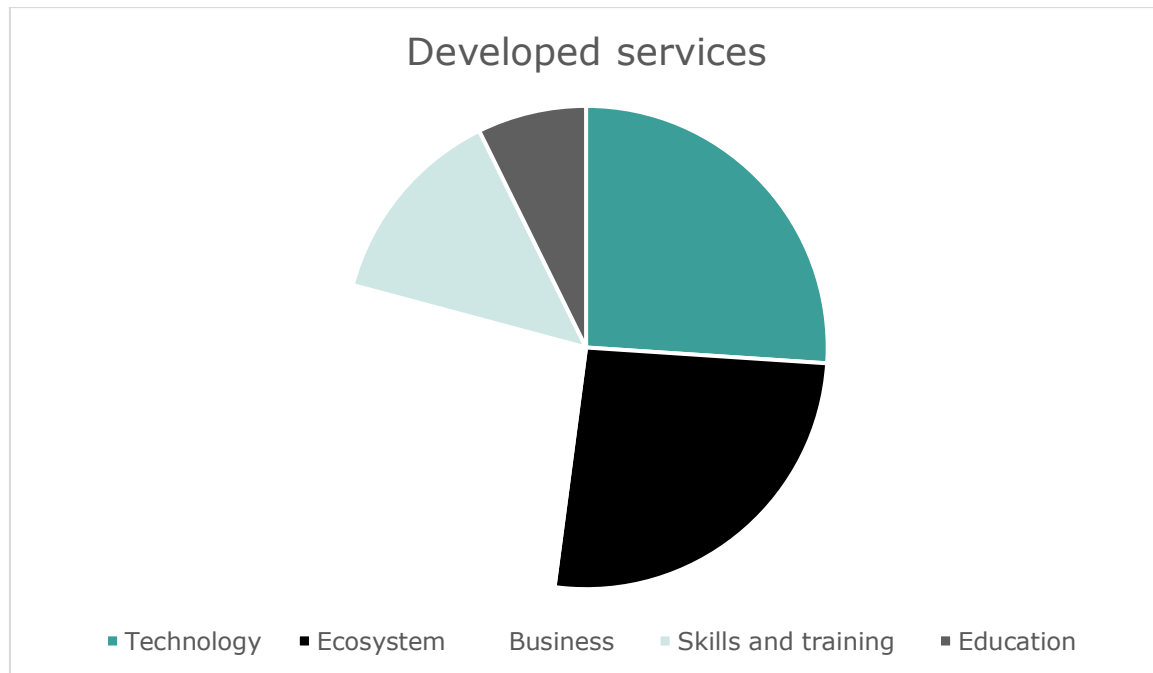


Figure 1 Overview of developed services within SERVICE OC

Business services, a total of 26 services

Average maturity assessment before SAH 1.27

Average maturity assessment after SAH 4.61

Technology services, a total of 25 services

Average maturity assessment before SAH 2.68

Average maturity assessment after SAH 4.2

Ecosystem services, a total of 25 services

Average maturity assessment before SAH 1.32

Average maturity assessment after SAH 3.76

Education services, a total of 7 services

Average maturity assessment before SAH 1.16

Average maturity assessment after SAH 3.1

Training and skills services, a total of 13 services

Average maturity assessment before SAH 1.76

Average maturity assessment after SAH 3.84

Improved services

In total, 16 DIHs worked on approximately 111 services, which were already within their service portfolio. Six DIHs did not work on the improvement of existing services, but rather on the development of new ones only.

The most improved services were Ecosystem related services 42, followed by Business 33, Technology services 22, Skills and training 8 and Education 6.

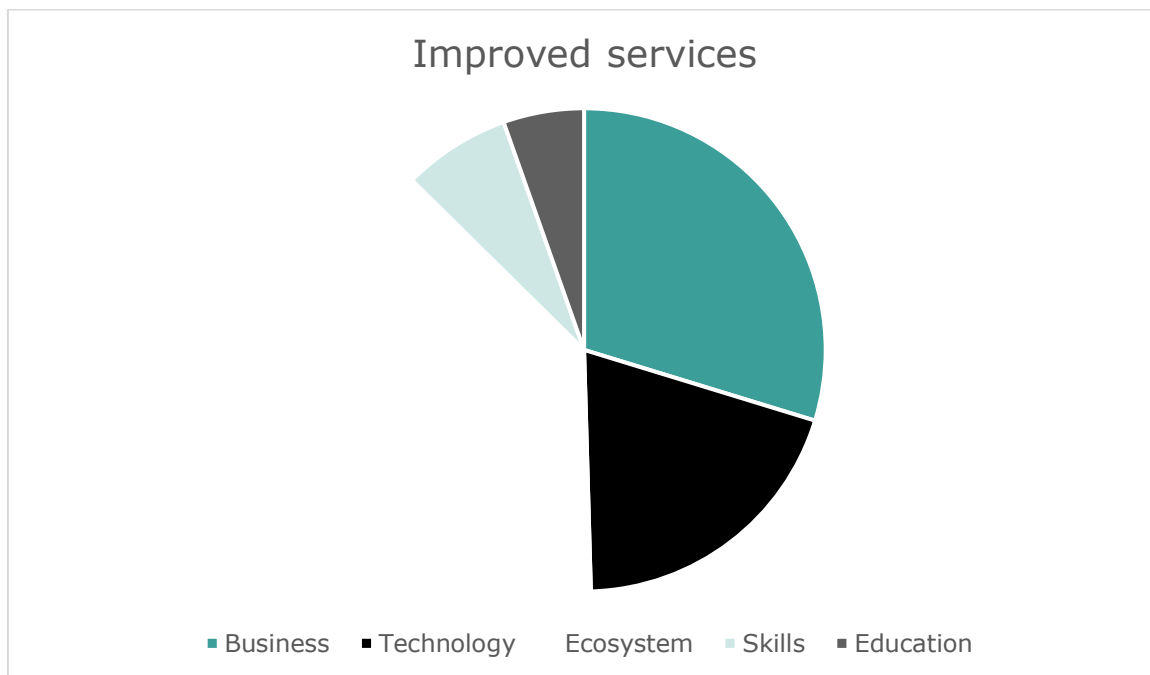


Figure 2 Overview of improved services within SERVICE OC

If we combine the two categories (developed and improved services), we can see that the most common services are those related to the ecosystem, followed by business and technology equally distributed, skills and education as a service with the least provisions.

If we look at the overall maturity levels, it is noticeable that they either improved or remained the same, mostly in cases they were at a high level already.

Total number of services 111

Ecosystem 48 services

Maturity improvements were detected with 21 services. The average improvement was 1.07.

Business 33 services

Maturity improvements were detected with 16 services. The average improvement was 1.

Technology 22 services

Maturity improvements were detected with 13 services. The average improvement was 1.42.

Skills and training 8 services

Maturity improvements were detected with 5 services. The average improvement was 1.3.

Education 6 service

Maturity improvements were detected with 3 services. The average improvement was 2.

3.2.5 RESTART for DIHs and RESTART for SMEs

RESTART OC was finalised under the second reporting period and best practices and lessons learned are presented in D3.8.-1, with 21 projects in total (RESTART SMEs 8 and RESTART DIHs 13). 18/21 projects were finalised in 2020 while 3 projects were finished within the first three months of 2021.

In 2022, we reached out to RESTART projects and provided them with a set of questions targeting their developments and support to the winning teams/developed after the project was ended. Not all projects have responded; nevertheless, this chapter presents analysis of

the collected answers allowing us to better understand how the results achieved are sustained and developed further to reach new concepts, solutions, ideas, services and financial support.

RESTART for DIHs

All in all, 6/13 project provided answers to additional questions. The coordinator of the projects were DIHs, while three DIHs are also eDIHs, one is associated partner of an eDIH, while two are neither associated partners or selected eDIHs.

As mentioned above, most of the projects were finalised in 2020, when asked to provide information about the provision of support to the winning teams 2 years after the projects are over, 5 DIHs answered that they are continuously supporting hackathon winners by providing the following services:

Ecosystem:

- Offering the support teams' continuous visibility on DIH's social media channels and providing commercial links with big realities associated (RESPOND 1)
- From 10 identified initiatives, the DIH is providing assistance to one by linking it to IT solution providers (RESPOND 7).
- Connecting to the ecosystem, profile raising; Fruitful collaboration established which resulted in new projects (<https://agri-epicentre.com/wp-content/uploads/2022/08/Antobot-case-study.pdf>) (RESPOND 8)
- Connecting one of the winners with the local company, facilitating the knowledge transfer and commercialisation process, social media, matchmaking (RESPOND 8)
- Promoting winners through social media, facilitating the process of matchmaking (RESPOND 9).

Business:

- Supporting the winning solution with applications for grant funding; As a result, two projects were granted along with a range of other discussions around new opportunities. (RESPOND 8).
- Collaborated and won a proposal with one of the winning teams, "mael: MicroAlgae Extracts for Low impact next generation food" implementation timeline: 2022 – 2024 (RESPOND 9)
- Access to the application for organisation and facilitation of remote work, connection the teams to business experts (RESOIND 10).

Additional funding

2/5 DIHs received additional funding after the RESPOND project was finalised:

- Regional funding from the Departmental Council of Tarn to support them in their actions. Part of the funding has been identified for specific support to the implementation of the solution (RESPOND 7).
- New public grant funding was obtained for two projects supporting Antobot's development:
 - Defra Farming Innovation Pathways (Industrial Research Strand): Project Insight - Fruit Scouting Robot Validation and Integration into Supply-Chain. Total project size £730,760; Total grant awarded: £555,602
 - Defra Research Starter: Viticulture 4.0 The Digital Infrastructure. Total project size £55,908; Total grant awarded £49,152
 - A grant confirmed via EIT-Food (will be paid by UK Govt. through the Horizon Europe Guarantee Scheme) to extend the scope of the Viticulture 4.0 project involving additional partners/technologies. This is paid to Agri-EPI at €24,123. (RESPOND 8).

Market readiness

Hackathon solutions from RESPOND 1, 7, 9 and 10 are on the market, while from the remaining two RESPOND projects are not. The following solutions are on the market:

- RESPOND 1 - The solution oriented to HORECA market is at a very early stage and experimentation is in progress.
- RESPOND 7 - The winning solution is an aggregation of 2 components already on the market (Racks and e-business platform). Remained to develop an API to make the link between these 2 solutions.
- RESPOND 9 - 2 out of 3 winning solutions are on the market: - Crop Shepherd: not on the market yet - Solmeya: on the market with microalgae production - Fauna Smart Technologies: on the market with their application for plants.
- RESPOND 10 - The winning solution "Mangeons Loc'ALS" is on the market.

While the RESPOND 8 solution is not commercially available but undergoing commercial trials. The solution is anticipated to be market ready within the next 2 years.

The main obstacle mentioned by the companies for the RESPOND 13 solution is the lack of time to develop and refine the concept. The company is not intending to launch the solution on the market anytime soon.

The DIHs were asked if hackathons a good methodological way to support innovative solutions

All the DIHs have responded positively to this question, and their answers are summarised below.

- It helps them to find out innovative solutions with a rewarding mechanism that further allows DIH to push potential entrepreneurs to share their ideas.
- They found hackathons helpful for building new collaborations and raising the profile of technology companies, as well as awareness of (farming) industry challenges among technology developers, and to support applications for funding to further develop early-stage ideas.
- It is proven to be a very efficient and effective way for identifying new solutions, start-ups and SMEs, while enabling a foundation for continuous collaboration and provision of DIH services
- Collective intelligence is allowing new ideas to be generated and allows projects to go further in a shorter time. They also present a good opportunity for the project leaders to develop their networks and meet partners or provide support to the project.
- One DIH noted that hackathons have become increasingly popular in recent years as a modern tool for innovation – allowing participants to work in small groups in a unique environment, encouraging creative thinking and leading to surprisingly innovative new concepts, ideas, and prototypes.
- Hackathons are a good support for innovation as long as they are well prepared and organised.

Based on the answers provided above, it is not surprising that all the DIHs are planning to organise similar events in the future as they learned a lot for previous experience and are looking for opportunities for new hackathons. One DIH responded that the realisation of the next one will go most likely through commercial sponsorship. Another one said that they plan to organise them annually, while one DIH said that they are already organising similar events as part of the Agreeen Startup competition to stimulate the creation of projects related to the agriculture of tomorrow and to highlight good ideas.

RESTART SMEs

In total, 4/8 projects provided answers to additional questions, reflecting on the sustainability element of their solution (RESPOND 3, 5, 6, 7).

Solutions under **RESPOND 5** <https://marketsostenibles.es/> (TRL 8) and **RESPOND 7** <https://www.linked.farm/> (TRL 9) are already **on the market** as of December 18th, 2020, and December 30, 2020.

As for the two solutions that are **not on the market**:

RESPOND 3- Although the fruit packer (TRL 7-8) is not on the market at this stage, the team is working on its development as additional functionalities were needed as a result of the field test. The solution is under development and in September 2022 new field tests were in the plan. The fruit packer was previously presented at the of the fairs.

RESPOND 6 – The DIH's software partner has not produced a working app, partly due to underestimation of the complexity of especially the data-exchange with dairy farms, and the foresight of a sober business case regarding finishing and hosting of the app. In addition, the software partner has been acquired by an American start-up company, which has different strategic objectives. Therefore, delivery of the working solution is at question at this stage.

Regarding received **additional funding**, only one project received additional public and private funding, while on of the project received funding for the training of veterinarians, not directly related to the solution but in line with its objective.

4. CONCLUSIONS

The third reporting period was characterised by a high number of OC projects, resulting in a high volume of best practices, success stories, and lessons learned. As the OC projects were delivered and coordinated by DIHs, the learnings are valuable information for other DIHs, and other actors involved and interested in the agri-tech sector.

With the high number of open call projects, there was also a large number of services either developed or improved by participating DIHs. Those services were categorised within the following categories: business, ecosystem, technology, skills, and education. While EXPAND OC with 11 projects and SERVICE OC with 22 projects were directly working on the development and improvement of the services, RESTART projects as well as RESPOND for DIHs were working on the development, organisation and implementation of hackathons and challenges. Services implemented within the scope of these two OCs were related to the provision of ecosystem and skills/education/training services for the most. For this reason, these particular projects were not asked to provide an assessment of the services improved, instead, the focus was on the sustainability of the work conducted and the provision of the support to the winning solutions. Further, PREPARE OC was orientated towards the development of new proposals by DIHs, and the sustainability of those 15 projects is directed towards collaborative efforts of the partners involved, and the application of the developed proposals to other funding opportunities.

The two open calls that were more intensively related to the provision of the services are 11 projects under EXPAND OC and 22 projects under SERVICE OC. In total, these 33 projects worked on approximately 328 services (EXPAND 121 and SERVICE 207). The most provided service was from the ecosystem category – 95 services, followed by 85 business - related services, 80 were related to technology, and 62 to skills, training and education. During the implementation process, DIH communicated to WP3 a high satisfaction rate with the implementation of their respective projects, helping them to – shape their portfolio of services, build, and improved new services and strategies, expand and build new partnerships.

In addition, to the provision of services, the learning processes related to other operational elements of IE implementation were also captured, such as technology-related practices, collaborative experiences, implications of the Covid-19 pandemic and challenges encountered within the process. All these experiences are captured and presented in the deliverable Annex.

Projects arising from the OCs noted that they will continue working on their solutions, services, and products (with exception of one or two projects). The SAH project not only helped them to shape their internal operations but also was a very valuable networking opportunity across the European regions and beyond.

5. ANNEXES

D3.8-2 Annexes can be found on the following [LINK](#), including:

Annex 1 – Overview of FIEs per RC and Open Call projects.

Annex 2 – Third reporting period FIEs, success stories, best practices and lessons learned.

Annex 3 – EXPAND lessons learned, best practices and success stories.

Annex 4 – RESTART- plans, impact, lessons learned and success stories.

Annex 5 – PREPARE lessons learned.

Annex 6 - SERVICE lessons learned, best practices and success stories.

Annex 7 – Overview of services developed and improved within SERVICE OC.