D2.1
REGIONAL CHALLENGES

WP 2

November, 29th 2019

An Overview of Regional Challenges that were organized in the first period of the project

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
API	Application Programming Interface
CC	Competence Centre
D	Deliverable
DG AGRI	European Commission Directorate General for Agriculture and Rural Development Centre
DG CONNECT	European Commission Directorate General for Communications Networks, Content & Technology
DIH	Digital Innovation Hub
DIY	Do-it-yourself
EC	European Commission
e.g.	for example (abbr. of Latin "exempli gratia")
FIE	Flagship Innovation Experiment
ICT	Information and Communication Technology
IE	Innovation Experiment
i.e.	that is (abbr. of Latin "id est")
IoT	Internet of Things
ISO	International Organization for Standardization
NDA	Non-disclosure agreement
NGO	non-governmental organisation
RC	Regional Cluster
SAH	SmartAgriHubs
T#	Task#
UX/UI	User Experience/User Interface
WP	Work Package

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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 startups, 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

The main objective of the SmartAgriHubs project is to consolidate and foster a European wide network of Digital Innovation Hubs (DIHs) for Agriculture to enhance the Digital Transformation for Sustainable Farming and Food Production. To facilitate the expansion of this network, SmartAgriHubs is planning one or also several open calls. They will offer 6 Mio Euro in total for the realisation of Innovation Experiments that are supported and coached by regional DIHs and thematic competence centres. This expansion shall be carefully aligned with regional needs and opportunities as well as allowing to validate the realised coaching and support mechanisms.

In order to support this process, the team of the SmartAgriHubs work package 2, developed an overall approach to support regional clusters or DIHs in organising different types of events for identifying needs and opportunities with respect to digital innovation in the agri-food sector. Specifically the following types of events are considered as basic instruments to get in close contact with the regional stakeholders:

- Workshops that are prioritising needs, requirements and opportunities that are characterising the situation in a specific region as well as identifying cross-regional collaboration potentials.
- Hackathons that are going beyond the identification of opportunities, and develop minimum viable products, making use of tangible data, based on a promising business model.

The WP2 team supported the realisation of initial events to validate the approach. Based on this, material and tools were elaborated that shall enable regional teams to also autonomously organise their events.

Especially the hackathons proofed to be very powerful initiatives to connect regional stakeholders from agri-food and tech communities. Tangible solutions were developed during intense working sessions of interdisciplinary teams that combined grassroots knowledge, state-of-the-art digital technologies, and innovative ideas. For achieving such tangible outcomes, hackathons need to be properly prepared within a period of 3 to 4 month in advance as well as asking for a coordination of the follow-on activities. Also the involvement of successful technology providers is key. Only those can formulate real world problems to be overcome as well as provide required data and technology infrastructures that are reflecting realistic agri-food environments. Finally, hackathons will link relevant groups from the moment of preparation on. DIHs can use hackathons to overcome current issues in the area of match making, fundraising, ideation, partnership building and kick-starting innovation experiments.

The workshops can be considered as a complimentary tool that are paving the way towards elaboration of regional strategies for digital innovation. Stakeholders can discuss their issues as well as defining short to medium term roadmaps for collaboration and future match-making. The involvement of stakeholders from different regions can also facilitate cross-regional initiatives, enabling access to knowledge, training and technology. Using the so called Mini Hack CANVAS offers a straight forward tool to validate ideas in terms of their business models and technological perspective.

Independent of the type of activity, the need for involving farmers and agronomist for discussing needs and requirements became clear. They are able to give tangible feedback in terms of potential user acceptance and prioritisation of digital innovation pathways.

The gathered results will be used as input to develop a roadmap for network expansion. At the same time, regional clusters are encouraged to organise additional events and provide their feedback to complement the findings with additional insights.

The diversity of the needs, requirements and opportunities, also taking into account local funding opportunities, is a plea for the flexibility in the design of the Open Call. Since the open call design shall not restrict proposal to a one and only model for digital innovation, but being open to diverse needs and regional structures. At the same time, the subsequent work on the roadmap shall elaborate on the potential funding of regional hackathons as tools that can mobilise stakeholders and elaborate new ideas for digital innovation that are characterising an out of the box thinking compared to current agri-food solutions.

1. INTRODUCTION

1.1 SMARTAGRIHUBS

The main objective of the SmartAgriHubs project (SAH) is to consolidate and foster a European wide network of Digital Innovation Hubs (DIHs) for Agriculture to enhance the Digital Transformation for Sustainable Farming and Food Production.

SAH is organized in six work packages (WP):

- WP1 Ecosystem Building
- WP2 Network Expansion by Open Calls
- WP3 Monitoring and Evaluation of Innovation Experiments
- WP4 Digital Innovation Hub Capacity Building and Monitoring
- WP5 Competence Centres
- WP6 Project Coordination and Management

This deliverable is part of Work Package 2 (WP2), focussing on network expansion by open calls, which will support initiatives that will finally expand, validate and strengthen the network of agri-food DIHs that are directly facilitating the usage of CC services and coaching the realisation of IEs.

SAH is building on an extensive European network of existing DIHs and Competence Centres (CCs) that are acknowledged by local agricultural and ICT communities. This network is based on several accelerator projects (e.g. SmartAgriFood, FInish, FRACTALS, KATANA) and is further leveraged through the Internet of Food and Farm 2020 (IoF2020).

Figure 1 visualizes the five basic concepts to build and foster this network of DIHs and CCs. DIHs are the key components to support Innovation Experiments (IEs) in their specific region. Next to the role of organiser and initiator of IEs, DIHs act as community builder connecting needs and solutions, identifying CCs and funding opportunities. DIHs are organised in Regional Clusters (RCs) to facilitate identification and addressing of regional challenges and opportunities.

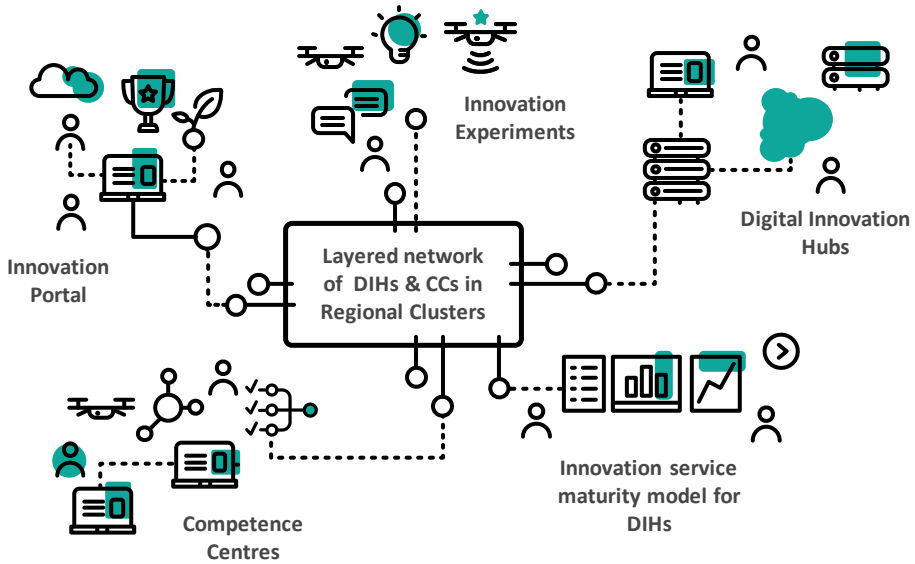

Figure 1: The five basic concepts that are applied in SmartAgriHubs to build and foster a layered network of DIHs and CCs in regional clusters in Europe

The SAH Innovation Portal acts as a communication tool to exchange ideas and experiences among RCs and DIHs as well as to provide a platform for IEs to discuss on digital innovation. Finally, the innovation service maturity model provided by SAH WP4 offers feedback mechanisms for DIHs to learn about white spots in there service level.

1.2 OBJECTIVE OF WP2

The main objective of WP2 is to expand the network by open calls, requesting for new initiatives that will:

- Increase the number of Innovation Experiments in order to create new digital innovations and solutions and
- Create or identify new DIHs and CCs to facilitate and support the realisation of IEs.

WP2 does so in three tasks. The objective of task 2.1 (T2.1) is to organise regional challenges (meetings, hackathons or other events). These events should identify regional opportunities, needs and white spots with regard to digital innovation in the agri-food sector and finally result in new IEs. T2.1 was organising events and supported RC teams and DIHs in the realisation of their individual workshops/ events. The aim of T2.2 is to identify how these needs and requirements can be adapted to the available (regional) public and private funding in combination to the envisaged SmartAgriHubs Open Calls. Task 2.3 will finally take care for the Open Call management itself.

1.3 OBJECTIVE TASK 2.1 AND ACTIVITIES

The original objective of T2.1, was to organise so-called challenges to identify regional opportunities, needs and white spots with regard to digital innovation in the agri-food sector.

On top of that, WP2 used the opportunity to join forces with the regional clusters in the realisation of events. The WP2 team was aiming at the development of an approach for organising events, where DIHs gather feedback that could be used for the analysis of regional needs, issues and opportunities.

The approach is also inspired by the fact that RCs together with DIHs, are themselves aiming at the definition of needs and opportunities in their region. Next to this, there is a huge diversity in regional needs and requirements, and regional DIHs are highly capable connecting to the specific contexts. Because it will be difficult to define such an approach at once, WP2 activities are a combination of desk research and iterative testing in the 'field' through co-organizing challenges. This enabled the WP2 team to learn about regional needs, the current ecosystem, identify opportunities and use key findings for the approach as part of designing the open call. This approach is visualized in Figure 2. It shows the activities of T2.1: a desk study, the actual co-organizing of challenges and the follow-up support in the future.

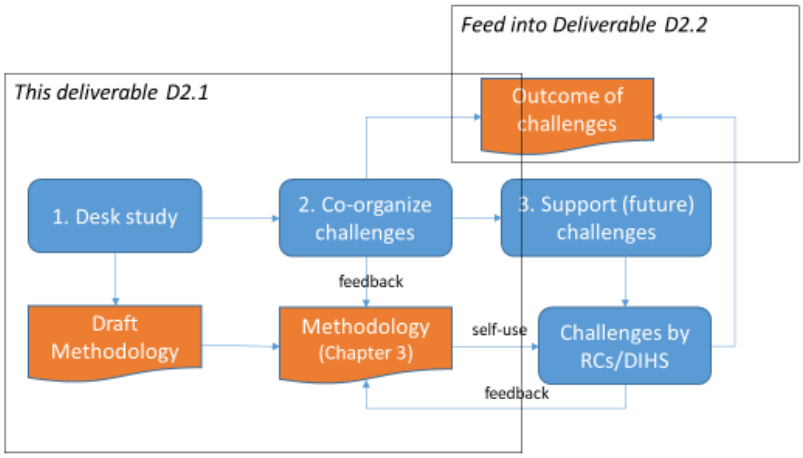

Figure 2. General approach for deriving the methodology to organise regional challenges.

The desk study took place in May 2019 and consisted of extracting experiences from previous projects and the basic concepts applied, resulting in a draft methodology. The co-organising of the challenges started in May and ended in October 2019. The support to (future) challenges that DIHs can expect from WP2/SAH is part of the Methodology.

1.4 TYPE OF CHALLENGES

WP2 co-organised two types of events. The first one is a one day workshop (a Regional Cluster meeting), the second one is a hackathon. The idea for one day workshop resulted from the desk study activities[1]. The general schedule of the workshop is to give presentations in the morning and to do targeted workshops in the afternoon. Hackathons are open innovation events that could lead to prototypes of IEs, which makes them have results that are in line with the overall objective of SAH. They are rooted in a community oriented approach and power of peer to peer learning, so they potentially could also put the DIHs in their role of community organiser.

In the period May and October the WP2 team had the opportunity to link up with two hackathons. In total five events were co-organised which gave the opportunity to learn about the current regional ecosystems and identifying needs and opportunities.

The outcomes of these events were used for the improvement of the methodology as well as input for the design of the open call(s) (i.e. input for D2.2).

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[1] For example the Ontwerpstudie Nationale Proeftuin Precisie Landbouw – NPPL, Ontwerp Eindrapport 18-12-2017 (Design study National Experimental Garden, Final study of December 18, 2017). This process aimed at the adoption and dissemination of ready to market digital practices. At that time a mix of stakeholders was invited to participate in a one day workshop. After plenary presentations stakeholder working groups prioritized the areas and bottlenecks for further development.

1.5 OUTLINE OF THIS DELIVERABLE

This deliverable (D2.1) is one of the two deliverables of T2.1. The following deliverable (D2.2) is an inventory of regional specialities and requirements and a design for the Open Calls ('roadmap').

Chapter 2 presents the overall approach applied for organising regional challenges. The primary audience of this chapter are the RCs and DIHs.

Chapter 3 describes the challenges that were co-organised by WP2, their outcomes and points of attention for the methodology of organising challenges as well as its tooling, and points of attention for the Open Calls.

Chapter 4 concludes on the methodology and these outcomes, and gives input for the roadmap towards the Open Calls (D2.2).

Throughout this deliverable 'challenges' refer to events (meetings, workshops, hackathons), unless stated otherwise.

2. METHODOLOGY TO ORGANIZE REGIONAL CHALLENGES

2.1 INTRODUCTION

This chapter presents the methodology to organise challenges/events to identify regional opportunities, needs and white spots with regard to digital innovation in the agri-food sector. The primary audience of this chapter are DIHs and RCs. On the one hand, this methodology aims at supporting the DIHs and RCs to work autonomously in organising these challenges. On the other hand, WP2 is asking them to provide feedback that is used as input for the SmartAgriHubs open call definition and management. The chapter is organised in three sections outlining the following:

- Approach for initiating the collaboration with regional clusters
- Organisation of hackathon by a DIH in close collaboration with end-users of technology, providers of data, research and competence centres
- Organisation of regional cluster meetings *aka* workshops for a regional target audience, while specifically addressing regional DIHs, CCs and parties that have an interest in the support and coaching of an IE (e.g. end-users, technology providers, service providers).

2.2 INITIATING THE COLLABORATION WITH REGIONAL CLUSTERS

Within the context of SmartAgriHubs the realisation of new IEs is seen as basic vehicle to expand the network. Since besides the individual realisation of the innovation experiment, an IE is coached by a DIH and can ask a CC for support with respect to specific competencies and technologies, while the DIH is also helping an IE to identify the appropriate CC from a topical network with no specific regional allocation. At the same time, the interaction of the IE with DIHs and CCs shall serve for the validation of their offered services (see Figure 3), while this validation process is specifically supported by the WPs 3, 4 and 5 of SmartAgriHubs. Nevertheless, WP2 needs to understand the different specifics that shall be reflected by the open call management.

To initiate a tangible collaboration with regional clusters, WP2 was elaborating a so called "Communication Package". It is outlining the support that is offered by WP2 as well as asking for feedback. It introduces the project, but underlines the responsibility that Regional Clusters (RCs) have, together with the DIHs, to define their own lines of action. DIHs' role is basically that of a 'community manager' and they should bring focus in digitisation of the agri-food sector and develop a stimulating environment that offers access to expertise, funding and technical support.

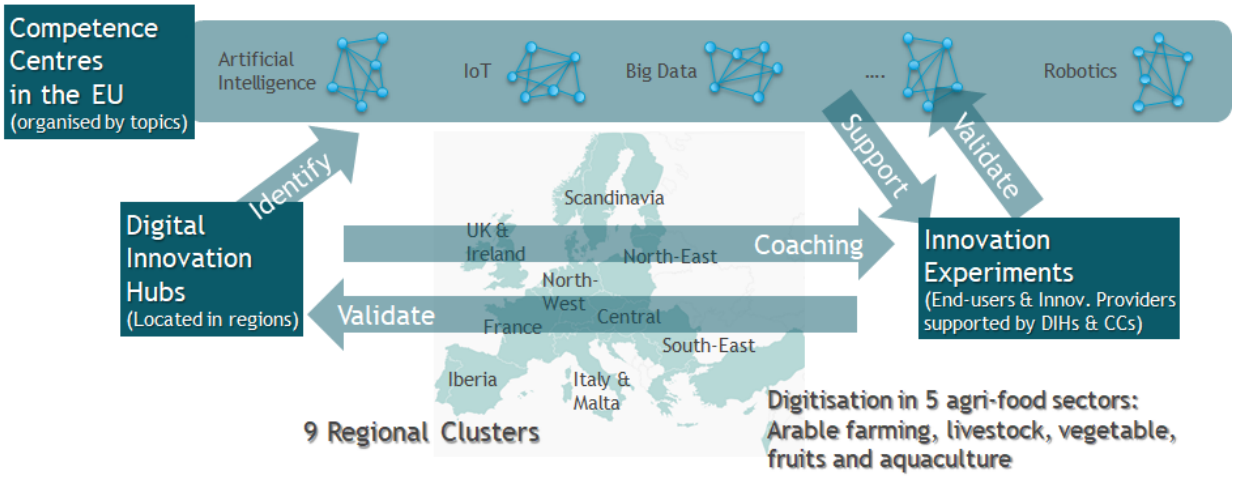


Figure 3: SmartAgriHubs core Stakeholders for Network Expansion.

The lines of action can be very specific, depending on:

- the regional agri-food characteristics,
- level of technology adoption,
- typical organisational structures,
- business/market conditions or
- DIH/CC maturity and networks coverage.

This is another reason why local DIHs should be in the lead: they are in the best position to know needs of the agricultural sector and connect these to the AgTech community.

The future support of WP2/SAH will still consist of giving input to challenges on a more modest scale. For example, WP2 already joined for example the Regional Clusters Ireland & UK and Scandinavia through skype to share time line and preliminary ideas for the set-up of the Open Calls.

The Communication Package is represented by a short document that was individually sent to the regional clusters (see Annex 1.1 Communication Package).

2.3 METHODOLOGY TO ORGANIZE A HACKATHON

Hackathons can be very powerful to make the connection between leading stakeholders in agriculture and tech communities and to generate ideas for new experiments, but they come with a lot of effort. Starting point of their preparation process are the problems of stakeholders/ clients of DIHs. When DIHs have identified already some problems of clients and their needs or questions, they could consider organizing a hackathon.

If RCs and DIHs need to explore more first about on the needs and requirements of the agri-food sectors or the tech sector, the starting point could be to organise a Regional Cluster Meeting. In the 'hackathon language' this meeting could be conceived as 'pre-event' where relevant stakeholders are gathered, needs collected, focus areas extracted and some solutions pointed out.

DIHs can use hackathons to overcome current needs in the area of matchmaking, fundraising, ideation, partnership building and kick-starting IEs. The methodology to organise

a hackathon was provided by FarmHackNL that is specialized in organizing hackathons in the agricultural domain. To enable other organizations in Europe to organize these type of hackathons a 'do-it-yourself hackathon tool kit' was developed. The 'read me' version of the Fast Track gives the 14 steps to organise a hackathon. The time line for organising hackathons is about three months. The Fast Track provides insight in how to recognize hackathon suitable problems, the need for focus and how to distil sub-topics (i.e. questions to be addressed in the hackathon) that are interesting. The DIY hackathon tool kit was updated after the two hackathons that were linked to the SAH project, the NIK Academy hackathon in Bulgaria and the Wageningen University Life Sciences Hack. More information can be found at the FarmHack website (https://www.diyhackathon.farmhack.nl/) and the SmartAgriHubs Innovation Portal.

For characterising the hackathon as a competition for the best ideas, concepts and solutions, it is best practice in the start-up community to allocate prize money for the winners. Besides raising the motivation of the participants by such an extrinsic factor, it is also a helpful tool in attracting attention in the preparation phase of the event. Potential participants are attracted to check for a possible participation as well as third parties and media are attracted to further disseminate about the hackathon. Depending on the characteristics of the hackathon, the prize money can also help young talent to focus on the refinement of the initial solution and facilitate further attraction of potential partners, also covering later costs for joining match making activities and travels. By this, those teams can also be enabled to set-up an innovation experiment, while also mobilising a critical mass of end-users from the agricultural sector. To manage this process of giving prizes to the winners, the organisation of the initial hackathons already included a so called prize money protocol as included in Annex 1.2 Prize Money Protocol.

It is very important to stay in contact with participants after the hackathon, do follow-up activities and harvest outcomes. The FarmHack Interaction Forum and the SmartAgriHubs Innovation Portal can be used for general communication. This can also represent the collaboration kick-off for a DIH to offer targeted actions for the stakeholders, helping them to take the prototypes of IEs to the next level as well as to validate their services.

A hackathon can also represent a tool that is helping a DIH to get in contact with the different stakeholders in its region. All the preparatory communication, the intense interaction during the event and the tangible results can prove that the regions can provide and mobilise:

- Talent in terms of individuals and organisations,
- Interest for digital innovation by agricultural stakeholders,
- Expertise for supporting innovation experiments,
- Finance to bring innovation to the next level and
- European dimension to facilitate collaboration with international experts

Finally, WP2 partners will contribute to the SmartAgriHubs innovation portal that contains a hackathon related section. This shall facilitate a tangible discussion as well as answering the initial doubts of whether starting the preparation of a hackathon or not.

2.4 METHODOLOGY TO ORGANIZE A REGIONAL CLUSTER MEETING

The organisation of regional meetings shall pave the ground for developing specific network expansion pathways. Since this will require a sound knowledge about the regional, economical and sectoral requirements for creating new IEs, DIHs and CCs.

The regional clusters are invited to organise specific cluster meetings or to combine regional events with related sessions to discuss requirements and potential alternatives for realising the envisaged open calls. Of course, this incorporates the collaboration with the other SmartAgriHubs work packages that are specifically managing the collaboration with IEs, DIHs and CCs.

The organisers of the meetings are asked to summarise the key output and share this with the team of WP2, for being able to consider those results in the preparation of the open call, the roadmap for network expansion as well as to facilitate regional and cross-regional matchmaking.

2.4.1 Coordinating the Objectives of the Meeting

The first step is to determine the objectives of the meeting for being able to match the meeting with the expectation of all related stakeholders.

Box 1 describes a program of a meeting that will both identify regional opportunities and needs as well as white spots with respect to digital innovation in the agri-food sector. It focusses on identifying and prioritizing the:

- Needs of the agri-food sector, and opportunities for digitalization, identifying if they are aligned with development efforts in current IEs,
- Technical shortcomings and opportunities as signalled by the IEs and CCs, also the opportunities to cooperate with other RCs, and
- Present level service by DIHs and what is needed to reach maturity.

Other topics could be added in this meeting or could be addressed in a follow-up meeting, as appropriate:

- Existing funding opportunities in the region, presenting them at the workshop as well as to discuss questions and shortcomings, and
- Lessons learned from earlier Open Calls that were relevant for the regions as well as for very specific.

The RCs and DIHs need to tailor-made the program to their situation as well build upon their knowledge and usual regional interaction.

The program below is based on a one-day workshop, including plenary presentations in the morning focussing on needs and a workshop session in the afternoon focussing on prioritized needs and finding opportunities. The workshop session is in small groups as this encourages active participation and involvement.

The next preparatory activities include the selection of topics for the program, finding partners and participants as well as preparing a rough program.

2.4.2 Preparation steps

2.4.2.1 Select Topics

In line with the objective and the idea to present overviews in the morning, the organiser prepares or asks others to prepare initial overviews of regional requirements for presentation in the meeting and a long list of regional requirements on:

- Needs of the agri-food sector, and opportunities for digitalization, and identify if they are aligned with current development efforts (IEs).
- Technical shortcomings and opportunities as signalled by the IEs and CCs, also the opportunities to cooperate with other RCs.
- Present level of services offered by DIHs and (organizational) issues they face to reach maturity.

Additionally, if the participants require further information about the SmartAgriHubs initiative and the process towards the preparation of the envisaged Open Calls a basic presentation is available (see Annex 1.3 Presentation of SAH). On top of that, also material and presentations from other workshops can be made available as far as appropriate.

2.4.2.2 Choose date and venue

The organizer chooses a possible date and selects a location for organizing the event. In accordance to the involved partners, this might require iterations, while the SmartAgriHubs innovation portal can be used to facilitate the organization as well as the attraction of additional experts if required. Of course, the preferred dates should leave enough time to find appropriate partners and participants.

2.4.2.3 Partners and participants

A DIH could partner up with other DIHs, RC or CCs for organising the event, while partners could also be found in the regional or local government as well as in funding agencies.

The suitable audience/ participants depend on the objective and topics of the event. The targeted audience for Open Call management, are for example other DIHs rather than farmers organisations.

Given the objective to identify needs, requirements and opportunities a mix of stakeholders relating to digitisation in the agri-food sector should be present as participants. Especially **farmers or farmer organisations** and food operators are needed as they are usually the end-users of innovations and could help to bridge the gap between the tech narratives (solutions) and need-narratives from the agri-food sectors. When the regional context is that the majority of farmers is small and there is a low degree of digitisation, DIHs should look for farmers' organisations (or their cooperatives or associations) for helping to identify their needs.

So stakeholders could include:

- Farmers (organisations)
- Other operators in the agri-food domain
- Advisers to farmers
- Technology and ICT companies

- Governments
- Funding agencies both private and public, as well as investors.

The target number of participants is at least 20 covering different stakeholder organisations.

2.4.2.4 Rough program and invitation of participants

Next step is to make a rough program and to approach **key note speakers** to give an introduction/ overview. This program should be made known to the identified participant organisations and for asking to safe the date.

Other steps:

- Finding **facilitators** for the workshop in the afternoon and finding somebody to chair the event are part of this step.
- If the event is organised between countries in a regional cluster make sure that **translation facilities are** available when needed.
- Make the event known to the wide public if their attendance welcomed (mobilize attention), where the SmartAgriHubs innovation portal could be one communication channel to spread the word.
- Send mail for reminder to the participant organisations.

The following box is presenting an example for a potential programme. This can be used as appropriate for the specific region, stakeholders and organisers. If there are specific questions or support required, this shall be discussed in the regional cluster, while also the related SmartAgriHubs work packages can offer related tools and support.

Box 1. Program for a Regional Cluster Meeting.

0. Welcome and purpose of the day

The objective of the meeting is to identify and prioritize regional needs and white spots as well as to find opportunities with regard to digital innovation in the agri-food sector through a matchmaking session.

1. Introduction to the SmartAgriHubs project (if needed)

Duration: 20 min.

Presentation of SmartAgriHubs, its objectives and structure. (See Annex 1.3 Presentation of SAH). This presentation will also describe the objectives of expansion by open calls, their current rough design and time line.

2. Overview of regional requirements

This overview could consist of different presentations focusing on:

- Needs of the agri-food sector, and opportunities for digitization, and identify if they are aligned with current development efforts like realized in regional IEs.
- Technical shortcomings and opportunities as signalled by the IEs and CCs, also the opportunities to cooperate with other RCs.
- Present level service by DIHs and the challenges they face to reach maturity.

Duration: 0.5 hour each and 15 min each for discussion.

In discussion ask feedback on the presentations, comments, additional information or requirements. The long list of regional requirements can be extended with issues raised in the discussion. This list will be input for the afternoon session.

3. Optional: Existing/Planned Regional Funding Opportunities

Duration: 0.5 hour.

Presentation by funding agencies (public and private) on existing or planned public and private funding opportunities in the region.

Discussion of the objective: Inform DIHs, IEs, CCs of any public and private sources they could access to overcome the requirements identified.

Discussion on how different funding sources can be combined.

Potentially partner up IEs, DIHs and funding sources - Combining different funding schemes.

Result: Overview of specific public and private opportunities (with links to further information and possible contact persons).

4. Optional: Lessons Learned from previous Projects and Open Calls

Duration: 0.5 hour

Presentation by IEs and DIHs (previously identified) on open calls realized in previous projects, highlighting best practices and lessons learnt to avoid less successful practices.

5. Prioritize

Duration of explanation: 5 min.
Before lunch the organiser asks the audience to prioritize requirements on the long list by stickering (each participant has 3 stickers). The organiser makes two lists: one on requirements/ opportunities for the agri-sector, and the other on white spots of the DIHs. Stress the importance of this action as it will be the input for the afternoon.

Lunch break

6. Matchmaking

Duration: 65 min (plenary, working groups, plenary).

This session shall be managed by a facilitator.

Use the Mini Hack canvas to summarize and structure the discussion at the tables (see Annex 1.4 Mini Hack).

Plenary

Duration: 15 min.

The afternoon session starts with the plenary discussion of the results of prioritizing the requirements/opportunities for the agri-sector. The facilitator suggests groups based on the outcomes (requirements with highest prioritization) and explains the work session that will use the Mini Hack canvas. **Each table should have a problem owner**. Discussion table for 5 to 7 people. Invite people to join the tables (by subscription or hand raising).

Working groups with 5 – 7 people each

Duration: 30 min.

- Introduction round (name, organisation, role in digitisation)
- Filling the Mini Hack canvas. Also the issue of funding can be considered.

Plenary

Duration: 20 min.

Canvas solutions are presented in the plenary for additional remarks

7. White Spots and Opportunities for the Open Call

Duration: 1 hour
RC/DIHs wrap up the workshop, presenting an initial overview of prioritized requirements for take up, and suggestions for their follow up. Conclude on funding opportunities, especially in relation to the prioritized ones. Identification of elements that can be considered in the open call. Conclude on requirements that are not prioritized.

8. Closure

2.4.3 Conducting the event and follow up

The schedule of the programme needs to be adjusted in accordance to the regional priorities. Nevertheless, the overview in the morning should be followed by an interaction with respect to the identified needs and to prepare items for a long list of needs. This long list will be prioritized at the end of the morning.

For the matchmaking work session (afternoon) the Mini Hack canvas shall be used for being able to summarize the group discussion within the Mini Hack Canvas template. The course of the session is described in Box 1. The group session could additionally brainstorm on a way to finance and implement innovative ideas. The plenary before the work session is to clarify the needs / questions and finding the interested audience for the discussion tables as well as finding specific problem owners. The plenary after the group discussions is to share outcomes and grasp additional ideas.

After the event: please provide **feedback** on conclusions (ideas to elaborate, follow-up actions) from the event to the:

- WP2/SAH project (see Annex 1.5 Format Reporting on a Regional Challenge). This report can be updated by RCs/DIHs in course of time in response to the changing environment. Also comments and feedback on the methodology is welcome.
- SAH community, using the Interaction Forum/ Innovation Portal enabling to share knowledge and experience,
- Regional network, to possibly receive reactions from other nodes in the network (investors, competence centres, other DIHs, etc.).

DIHs/ RC shall stay in **contact with (regional) stakeholders and to organize any suitable follow-up activities.**

3. OUTCOMES CO-ORGANIZED CHALLENGES

3.1 INTRODUCTION

This chapter describes the challenges that were co-organised by WP2, their outcomes and points of attention for the methodology to organise regional challenge and points of attention for the Open Calls. For outcomes we report on regional opportunities, needs and white spots with regard to digital innovation in the agri-food sector that were identified.

In the period between the end of May and October the WP2 team co-organized three events and had the opportunity to link up with two hackathons:

- Regional North East Europe Cluster Meeting in Poznan, Poland, May 30th 2019,
- Workshop at the Agripreneurs Summit 2019 in Thessaloniki, Greece, September 10th 2019,
- Iberian Regional Cluster Meeting in Seville, Spain September 23rd 2019,
- Hackathon of NIK Academy in Izgrev, Bulgaria, September 13th-14th 2019 and
- Wageningen Life Science Hack in Wageningen, The Netherlands, October 25th-26th 2019.

3.2 REGIONAL CHALLENGES

3.2.1 Regional North East Europe Cluster Meeting, Poznan

Event

The meeting was organized by the cluster coordinators; 40 participants from the Industry, R&D institutes, academia, DIHs, and regional advisory centres, from 6 EU countries (Poland, Latvia, Lithuania, Serbia, Czech Republic and Netherlands) attended this meeting.

Its purpose was to present ongoing activities of the IEs, to identify links between the IEs, to present DIHs to partners in the IEs and to identify potential collaboration of DIHs in the ongoing experiments. In the morning and part of the afternoon IEs, each DIH and the SAH project gave presentations on their work. Also FarmHackNL presented as DIH, focussing on the role of community building.

Input WP2

WP2 presented the SAH project (updated version in Annex 1.3) to stress the role of the DIHs in the network expansion. The online Interaction Forum was initiated (hosted by FarmHackNL) to exchange ideas and keep track of possible follow up, because the Innovation Portal of SAH was not yet online.

In the afternoon of the event FarmHackNL organised a peer to peer work session using their existing Mini Hack Canvas to match questions with (digital) solutions. This form summarizes solutions that a group finds for specific needs. The procedure of the session is that participants share their questions in plenary ('post-up') and, after clustering these questions/problems by the facilitator, find solution in their peer groups. The filled out canvas were shared in the plenary.

Outcome

Main agricultural challenges appeared mostly related to the low productivity, low usage of cutting edge technologies, poor soil quality and low amount of rainfall. Related to the latter

the need of ground water measuring was raised. Next to other issues mentioned shortly, the following ideas were elaborated in the peer to peer session using the Mini Hack Canvas:

- Use of drones Data access/processing: There is a need for real time hyper-spectral data processing. As solution an idea was pitched to organize a hackathon in Lithuania by the AgroSmart DIH for finding alternative cost/effective ways to process big drone data.
- Soil and land/use maps: There is a lack of comparable data within soil and land use data and a need for harmonized soil maps. In this way a tractor from DE can properly work along with all its specifications in Poland. The proposed solution is to establish communities and PP partnerships to organize and standardize this and make an app. The leader for this proposition is Foodie DIH.
- Competition cooperation: Farmers are exposed to a plethora of software vendors and technology offerings. There is no place to get an overview of these offerings with decision making capacity. The group dealing with this question devised a knowledge platform solution to be deployed by DIHs, due to their intrinsic neutral position. It is a comparative system on which you can select filtering parameters to see overview of tech competitors and their offerings. The platform will work based on partnerships with tech companies and NGOs. This is meant to help farmers decide on their desired tech solution.

Several questions concerning the SAH project and the open call were raised (like which topics will be included, the eligibility of single SMEs, the funding rate). It was also requested to receive more information about the envisaged time line of the open call procedure.

Points of attention

- The outcome shows that the meeting produces information on general, sectoral needs, but more concrete directions for solutions were derived from the peer to peer approach, using the Mini Hack canvas. The approach was evaluated at the spot and was considered a useful and lively approach. The plenary post-up (that was skipped in the event) could have resulted in better understanding of the problem/ question and to find the right interested audience to work on it.
- To accommodate the questions on the SAH project and process towards the Open Calls the Communication Package was prepared for the DIHs and RCs to clarify roles and responsibilities between WP2 and DIHs.
- It was also noticed during the event, although one of the organizing DIHs is rooted in agriculture, that more farmers' organisation could have been present to give a direct say on sectoral needs. So farmers (organisations) should specifically be invited to participate in the events.
- The organisers started interaction on the Interaction Forum, but it still remains a challenges how turn the portal into a lively and effectively communication channel.

3.2.2 Workshop Agripreneurs Summit, Thessaloniki

Event/ WP2 Input

The workshop was embedded in the Agripreneurs summit that represents a global event especially for start-up and SME type teams, aiming at the realisation of innovative business models. The purpose of the SAH workshop was to collect ideas for the Open Call implementation and to identify needs and requirements in the region. It was organised by the project partners ATB, Biosense and ILVO. About 20 participants joined the working session of which 80% were tech service providers. Other sectors present were: research centres, banking and government.

Outcome

Concerning DIHs, it was discussed that they could play an important role in enabling innovation experiments to understand rules, conditions and consequences of accepting specific kind of investments and/or funding.

Relevant needs of the agri-food sector and technical shortcomings/ opportunities were collected:

- The need of farmers for practical solutions was highlighted: to increase yield or decrease costs; for solutions that add direct value. Farmers know their problems but are not able to define correlating solutions.
- Environmental and growth conditions (though excellent in Greece) may not be sufficient to competitively grow fruit and vegetable. Premium qualities are also derived from greenhouses in other countries.
- The market in Greece focusses on affordable foods.
- Payback time of digitisation needs to be clearer.
- The majority of Greek farmers is small. There is mistrust of farmers with respect to the offered technology, and to share data. There is a low degree in digitisation, so higher threshold investments to smart farming. Also they have inappropriate educational background for the use of the technology which is hampering innovation.
- Cooperatives could act as enablers of digitisation, they could work on long time strategies for digitization.

Points of attention

- Given the intermediate role of DIHs in finding funds, it was suggested to allocate part of the open call money for DIHs based on their performance to attract additional funding.
- The outcome that digitization should bring practical solutions in this region (and of which payback time will be clear) should be validated with representatives in the agricultural sector. In the regional context with a majority of small farmers and low degree of digitisation DIHs should look for farmers' organisations or cooperatives for validating these needs and to enable digitisation. This will be included in the methodology.

3.2.3 Hackathon of NIK Academy, Izgrev

Event

For the AgriTech Hack several organisations came together as a collaboration between Bulgaria based NIK Academy, the Agri-Food Team of the Embassy of the Netherlands for Romania & Bulgaria, and DIH AgroHub.BG. From the Dutch & WP2 side the event was supported by FarmHackNL. Co-organisers were DSK Bank and Express. The preparation resulted in five challenges (tracks): IoT, Bee, Machine data, AI, Remote Sensing (See Annex 2.1 for specification). These were generic tracks to appeal the Bulgarian tech community which is full of talent and dynamic, but not so active in agriculture. There were 50 participants, plus 20 experts/mentors. Several high level speakers (from Bank, Ministry, tech company) and (start-up) mentors. Several Media attended for communication to farmers. Stakeholders, such as Farmers from the National Grain Producers Association.

Ten teams competed (Robot team from university, from weather stations, several tech4bee solutions, vines, decision support for farmers). The winning team were two brothers that built a web-based platform and a mobile app to track the origin and quality of foods, including their ingredients. It used elements of Big Data technology.

Follow-up is in the hands of DIH AgroHub.

WP2 Input

FarmHackNL supported NIK Academy using the Do-It-Yourself (DIY) hackathon tool. Finding challenges (tracks) that are the starting point of a hackathon needs about three months of preparatory work and much of effort and alignment with all stakeholders. The steps to organise a hackathon are described in the fast track read me version of the tool that is made available for DIHs (FarmHack.nl *https://forum.FarmHackNL.nl/hackathon support* or Innovation Portal). Because this was the first hackathon in Bulgaria the idea was not to make the challenges too specific, but specific enough to work on.

A protocol for prize money was developed.

Outcome

- Overall: this hackathon succeeded to reach IT people and to attract their interest in agriculture in Bulgaria and to work towards Bulgarian farmer's needs. Plus including other stakeholders - farmers, research, education, government, business. It created a great base for building an ecosystem and start collaboration. On top of that, many people joining the hackathon were able to better understand the problems and potential of the agri sector. This is not just true for the teams, but also mentors and the jury.
- Interesting concepts/prototypes were developed. Particularly for the winner, the hackathon attracted interest from stakeholders of the Bulgarian food supply chain (ongoing: meetings with farmers associations and retailers).
- It created opportunities for DIHs for tech pull instead of tech push, because of the involvement of farmers, domain knowledge and interdisciplinary collaboration. Opportunities were created to better know of who is who, who is willing, what is their focus, and how to get an alignment.
- This hackathon created a lot of press coverage, including TV programmes.
- Several follow-up activities are planned. One of them is that DIH AgroHub is organising meetings between teams and retailer organisations in order to see the potential for future development/investments of ideas and prototypes developed in the hackathon. AgroHub.BG will be the link between both and the host of the meetings. Another activity is that FarmHackNL explores collaboration with ACTA (French network of the Technical Ag Institutes) for organising hackathons in Europe.

For the involved DIH the impact was positive:

- AgroHub.BG concludes that the AgriTechHack had a major positive impact on the development of AgroHub.BG kickstart after a long period of talking. The hackathon gave possibility to attract new members of the hub (Professional Association of robotics and automation, IT developers etc.) and potentially to expand the portfolio of the services that the hub could provide. Giving them more chances to find private financing for the activities that AgroHub.BG should provide.

Points of attention

- More farmers/agronomists could have been included, either as mentors or part of the teams.
- Another issue is to have translators for the foreign mentors/judges to interact better with the teams and make the challenges more concrete and clear.
- Make the challenges more concrete and clear, and have problem owners.
- Main points to finetune the DIY tool kit:

    - Stress the importance of more balanced teams in knowledge and expertise, prepare a repository with the digital solutions developed, taking into account constraints with respect to IPR and non-disclosure.
    - Make the judging criteria more generally applicable and attach Excel Sheet for calculating and comparing teams.
- Interaction Forum/ Innovation portal should be used to stay in contact, harvesting outcomes. WP2/ SAH should strategize on this.

3.2.4 Iberian Regional Cluster Meeting, Seville

Event

Organizer of this meeting was the Iberian Regional Cluster, supported by WP2. The number of participants was 40 from 14 different organisations. Eight of these organisations are tech service providers, others included a bank, a government organisation, and knowledge and research centres. The purpose was to identify the:

- Needs of the agri-food sector, and opportunities for digitization, and identify if they are aligned with current development efforts (i.e. current IEs).
- Technical shortcomings and opportunities as signalled by the IEs and CCs, also the opportunities to cooperate with other RCs.
- Present level service by DIHs and the challenges they face to reach maturity.
- Funding opportunities.

Next to this there was a presentation on Open Call management.

WP2 input

To encourage interaction with the audience, WP2 suggested to build the program of the meeting in blocks that give overviews on the needs and requirements of 1) the agri-food sector, 2) the technical service providers, 3) the DIHs and 4) give information on funding possibilities. Next to this WP2 chaired the blocks and facilitated the wrap-up of the meeting.

The format for reporting on the outcome of Regional Challenges was used.

Outcome

Most relevant three needs of the agri-food sector and technical shortcomings/ opportunities, in order of importance:

1. Misalignment between user requirements in the sector and developments offered by technology providers. Users, particularly farmers, don't feel their needs are being properly addressed by existing solutions, which are often too general. The region includes quite diverse sub-sectors with very specific needs, which should be considered (e.g. olive production is quite different from berries or citrus). It is necessary to create mechanisms to bridge the gap between developers and users.
2. The region, particularly Andalucía, has a critical issue with water availability. Research and development in solutions that enable a more efficient irrigation are needed. Farmers are looking for systems to support them in making better decisions on a daily operational basis.
3. Users want to learn more about data collection over the whole value chain to enable traceability and add value to their products. They want to understand what the consumers consider as added value to the product, i.e. what the user would like to know as additional data. Farmers may be willing to share data if they understand the

use and added value, and how and by whom it will be used. In addition, users understand that they could learn from each other and are willing to collect and exchange some data within a community to build collective knowledge.

Although no specific events were planned immediately as follow-up, some concrete actions could make sense to consider: 1) bringing together users and developers in a kind of match-making between requirements and solution providers, 2) do a match-making event to introduce technology developers to funding opportunities. This would require some prototype, or at least proof-of-concept developed and a pitch presentation by the developers 3) organise a hackathon on the specific irrigation issue in the region.

Concerning the activities and functioning of the DIHs the priorities are (in order of importance):

1. Improving services provided by the DIH. It is perceived that DIHs in the region could improve services related to community building and technical support to the several users in the value chain. Several users are willing to participate in collaborative research projects or pilots, demos, testing of new products or services, and need support.
2. Acquiring digital infrastructure. Explanation: users have stated the desire to have government support in setting up a technical infrastructure that could be potentially shared by small-scale farmers. These farmers currently don't have access to the same infrastructure as large players. Associations could also play a relevant role in this topic.
3. Dissemination activities. Users want to know more about existing solutions and technologies through success stories. Therefore, support for some dissemination activities from innovation experiments could help them relate to similar problems and understand how they were solved.

Points of attention

- The program of the meeting worked out well to identify needs in a general way and based on the event follow up activities could be identified to proceed the activities of the RC/ DIHs.
- Note that also here the need for bridging the gap between developers and users is reported.

3.2.5 Wageningen University and Research Life Sciences Hack, Wageningen

Event

The first WUR Life Sciences hackathon was an initiative from several Bachelor and Master studies. The goal was to have creative tech talent (students, young professionals) work on targeted challenges (tracks) offered and mentored by representatives of Ag Tech companies. From the Dutch & WP2 side the event was supported by FarmHackNL. Four tracks could be developed, offered by leading companies: Unilever, Lely/Rovecom, Hendrix Genetics, and the governmental subsidy organization RVO (See Annex 2.2 for details).

There were 50 participants, plus 20 experts/mentors; seven teams competed.

Follow up is in the hands of WUR/FarmHackNL.

WP2 input

FarmHackNL supported the organization of the hackathon. The target was to mobilize well-composed interdisciplinary teams. Each team consists of:

- 2 representatives of the company
- 3 to 4 students / starters (from different disciplines)
- 1 or 2 researchers from the WUR (domain experts)
- 1 or 2 FarmHackers (e.g. machine learning, open source expert, front-end developer, app developer, UX/UI designer).

Outcome

- Overall: the event showed the power of hackathons, creating a space for people to play, to think, to interact within really good demarcations (time, place, people, expectations, rules) and things to aim at (questions, data). It creates opportunities for DIHs, as they can warm-up businesses to contribute to attracting tech talent. Hackathon can function as leverage to create funding opportunities.
- The tracks were highly specialized challenges. Well-defined problems mean that you can balance the ambition to have a broad appeal with the need for focus. This focus allows to have a more lean identification of challenges, mobilization of suitable hackers and other relevant preparation.
- A lot of unique data sets to do predictive modelling were realized, but they were up-close and personal with the companies.
- The balance between students and mentors in the teams worked out really well. Working across boundaries in a good mix is stimulating for all and generates high quality outcomes.
- Interesting concepts/prototypes were developed and follow-up and collaboration expected from at least two or three teams.
- Blogpost with results are available in the FarmHack forum, used for preparation and communication: https://www.farmhack.nl/results-wur-life-sciences-hack/

Points of attention

- This hackathon model should work well for other DIH's: involvement of the university contributed strongly to the commitment of companies. Strong hands on involvement of companies means less burden for the DIH, and it offers students and hackers an interesting environment within which to excel. This could be a typical hackathon model for DIHs. (Accompanied with model of on-farm hackathons).
- Planning of students events is very difficult, as they have extreme full agenda's.
- Data: it was a plus that we were granted access under non-disclosure contracts (NDAs) to a lot of data, but we lost control over data preparation due to too big or too specialised data. So this time we were not able support data donors with cleaning, documenting, transforming, filtering or even troubleshooting data. This was a burden to the teams.
- Intellectual Property: An important distinction is the degree of openness: some hackathons are completely open, results are published online and teams code open source. Others are private, deal with sensitive data and require the signature of an Non Disclosure Agreement, like this one. Golden FarmHackNL rule: outcomes belong to teams. If a team decides not to follow through, then ownership belongs to FarmHackNL (as organiser) in order to be able to offer it to the community.
- Huge efforts all around needed to organise this hackathon.

4. CONCLUSIONS

The main objective of WP2 is to expand the network by increasing the number of IEs that are creating digital innovations and solutions as well as to create new DIHs & CCs and to validate their services provided for the facilitation of IEs. To support this objective a methodology was developed for organising two types of regional challenges to identify regional opportunities, needs and white spots with regard to digital innovation in the agri-food sector.

4.1.1 Main findings on the types of challenges

- The two type of challenges (Regional (cluster) meeting and hackathon) deliver different types of outcomes and both are relevant to create new IEs as well as to prepare the realisation of the Open Calls. The meeting type of event would result in (prioritized) needs, requirements and opportunities that need to be elaborated in follow-up activities, while hackathons could deliver rough prototypes for IEs.
- Using the Mini Hack Canvas in peer to peer work sessions in the meeting type of event results in concrete ideas and directions for follow-up activities, while linking the relevant stakeholders. The method is most valuable when it starts with a clear problem ownership with respect to the question/problem for which a solution is discussed.
- Hackathons have proofed to be very powerful to make the connection between leading stakeholders in agriculture and tech communities and to generate ideas for new experiments and they result in first sketches of prototypes for IEs. In the Bulgaria hackathon the challenges are a wider focus than in the Wageningen hackathon, possibly reflecting the earlier stage of digitization in agriculture. So it shows the flexibility of the approach in different regions. Hackathons need a lot of preparatory work though, that will link relevant groups from the moment of preparation. DIHs can use hackathons to overcome current needs in the area of match making, fundraising, ideation, partnership building and kickstarting IEs.

4.1.2 Main findings for Methodology

- The DIY hackathon tool kit was fine-tuned based on the two co-organised hackathons and the methodology to organise a regional (cluster) meeting was developed. Both methodologies will be updated after being used autonomously. This feedback also increases the understanding of the innovation process.
- Whatever the kind of event, the need for farmers and agronomist to be present at challenges to discuss needs, requirements became clear, as they know needs in the sector and could feed knowledge to the solutions suggested by tech service organisations. Some tech service providers report to face mistrust of farmers with respect to the offered technology and to share data. So there is a gap to bridge here. The idea is to approach farmers through their farmers' organisations (cooperatives / associations) because they have a longer term interest and strategy on digitization. To involve famers is especially challenging when the majority of farmers are small and the level of digitization still low.
- International meetings should offer translation facilities.

- The Communication Package from WP2 was released in September. Also the Innovation Portal of the SAH project was launched mid-September. Both were introduced rather late in the process of identifying their needs and requirements, opportunities and matching funding for the RCs and DIHs. In meantime the Interaction Forum (hosted by FarmHackNL), was available from March 2019 on, but the interaction appeared to be limited. It shows that just creating the facility of a forum of portal in itself is not enough to generate communication and the exchange ideas in the community of DIHs. This is still a task for all in the community of DIHs to find out to how make the portal into a lively and effectively communication channel. The SAH in particular should strategize on the way to harvesting outcomes through the Portal for the time to go.

4.1.3 Preliminary input for the design of the Open Calls

Along with co-organising the events and developing the methodology the WP2 team came across points of attention for the design of the Open Calls:

- The diversity of the needs, requirements and opportunities, especially local funding opportunities, is a plea for the flexibility in the design of the Open Call.
- Given the power of the hackathon for generating ideas for IEs and connecting stakeholders, it should be considered to reserve part of the Open Call to support DIHs to do kick-off hackathons (based on proposals / performance).
- The idea to develop a model for a SAH hackathon should be considered. Or different SAH hackathon models that will work in the context of different levels of digitization.

These points will be further elaborated in D2.2 that will describe the potentials and targets for regional, sectoral and economic expansion.

ANNEXES

ANNEX 1

Annex 1.1 Communication Package

The following pages are presenting the communication package as provided to the regional clusters to initiate the related collaboration.

To	SmartAgriHubs Regional Clusters
From	WP2
Date	15 August 2019
Concerning	Communication about regional requirements (T2.1) and matchmaking (T2.2) in relation to the open calls

PURPOSE of this Communication

WP2 on 'Network Expansion by Open Calls' has started its first tasks on identifying regional requirements (T2.1) as well as matchmaking and DIH network interaction (T2.2).

The ultimate objective of these tasks is to identify the opportunities Open Calls can offer to foster the sustainable network of DIHs and CCs validating the services they provide to leverage and carry out impactful Innovation Experiments. At the same time, a strategy will be developed on how this can be matched with regional funds; private as well as public.

In the end, the Regional Clusters (RCs), together with the DIHs, are responsible for defining their own lines of actions. The SAH project, in particular WP2, is expected to support this activity but we do not have the resources or necessary budget for open calls to do this on an individual basis for all DIHs.

Therefore, we are developing materials and methods that RCs and DIHs can use for this purpose on a peer-to-peer support basis. Through this memo, we would like to communicate what you can expect from us and in turn what we expect from you.

What you can expect from us

T2.1 will provide a tangible working methodology and documents to organize **workshop sessions at a DIH or at RC level**.

The goal is to identify the regional requirements as well as to mobilize the stakeholder network of a DIH with regard to 'Digital Innovation'. These can be classified into:

- **Sectoral requirements** that can be specific for a particular region (e.g. olives around the Mediterranean);
- **Technical shortcomings and opportunities** (e.g. degree of connectivity or mechanization);
- **Organizational issues** (e.g. governance structure of the agri-food sector, level of education);
- **Business needs** (e.g. access to finance);
- **White spots**, coverage of DIHs and Competence Centres (CCs) in the region;

Many of these aspects can often be obtained from already **existing policy documents**. Although there will be region-specific matters, it is expected that there are also many similar aspects. T2.1 will try to provide real and tangible examples of this.

T2.2 will compile – in a joint effort with RCs and DIHs – a **map of available funding instruments** that potentially could be matched with the identified regional requirements.

Ultimately, this should lead to the **start of new Innovation Experiments** connected to the DIHs.

To progress towards the definition of types of open calls and the specific design of timing and related procedures, it is planned to start with the realisation of initial workshops that will provide a first insight in the regions. The outcome of the local workshop sessions can be:

- Identification of concrete partnerships of **new innovation experiments** in which a match is already made between ideas and funds that would help to validate interaction procedures in-between innovation experiment teams with DIHs and CCs.
- A specific **follow-up event such as a hackathon** to further explore the regional requirements and select promising concepts, interaction scenarios, prototypes, companies/start-ups, etc.
- Practical cooperation with **accelerator programmes** with tangible funders interested in joining forces with SAH.

In WP2, we are currently discussing how we could support these activities from the open call budget, while the envisaged workshops and subsequent regional events like hackathons will help us on using regional experience and lessons learnt to further elaborate the open call design.

The goal is to make this information available through the Innovation Portal. However, this is not yet in place so in the meantime we

- are available by **telephone** and **e-mail** (see details below)
- organize **webinars** in the coming months
- open a temporary **interaction forum** where you can follow and interact with on-going activities: https://forum.farmhack.nl/c/hackathon-support
- a **do-it-yourself toolkit** to organize hackathons: https://www.diyhackathon.farmhack.nl/

What we expect from you

The methodology as described above will be developed gradually and will be enhanced if we receive feedback from you when it is applied. Therefore, we kindly expect from the RCs/DIHs

- to **organize your own workshop sessions** identifying your regional requirements and follow-up actions with support from WP2 as described above;
- **provide feedback** in the interaction forum from this so that knowledge and experiences are shared within the network – in this way, it is also possible that you receive tangible offers from other nodes in the network (investors, competence centres, other DIHs, etc.).

Contact us

If you have any question about these tasks, please do not hesitate to contact us:

T2.1 Regional Challenges:

- Elsje Oosterkamp, Wageningen University & Research, elsje.oosterkamp@wur.nl, +31317484655
- Sjaak Wolfert, Wageningen University & Research, sjaak.wolfert@wur.nl, +31317485939

T2.2 Match Making and DIH Network Interaction

- Ana Espert, PNO Innovation, ana.espert@pnoconsultants.com,

Annex 1.2 Prize Money Protocol for Hackathons

Background

Work Package 2 of the Smart Agri Hubs program focuses on network expansion by open calls, which will run in 2020. The objective is to support and empower regional initiatives and grow them into impactful Innovation Experiments, through the open calls and by mobilising additional capacity through regional funds (both private and public).

In preparation of open calls WP2 is committed to actively support regional initiatives such as workshops, seminars, conferences and hackathons to identify opportunities, and embed them in the SAH ecosystem, offering access to a relevant network, sponsor and funding opportunities etc.

Hackathons are usually realised over 2-3 consecutive days, offering teams the opportunity to get access to end-users as well as business domain and technical experts. The development of solutions is done in a competitive environment often motivating teams to work in very intense sessions, helping to directly validate solutions. To fully characterise this type of event as a real competition, hackathons are usually combined with prize money for the winning team(s).

This document describes the procedure through which this support is granted. In short the following conditions apply:

1. The prize money is funnelled through a DIH
2. Teams are encouraged to work towards the SAH Open Calls
3. A SAH representative is present in the Jury
4. The SAH logo is used in all communication

Responsible Entity: Digital Innovation Hub

Digital Innovation Hubs are support organisations that aim to make businesses more competitive by speeding up the development and uptake of digital innovations. They provide these services close to the end-users and thereby cater to the needs of agricultural producers and food processors in a specific region. A prerequisite for the SAH hackathon support is that the support is funnelled through a DIH.

From WP2 side we kindly ask the DIH to help build on top of the hackathon results by guiding teams after the hackathon towards the upcoming SAH Open Calls. An important element will be the support of teams through matchmaking and mobilisation of potential partners and/or investors, accelerator programmes or other types of funding.

In a practical sense we ask the DIH to re-allocate the prize money to the winning team(s), in accordance with the jury outcome.

We also ask the DIH to actively participate in an open and public Forum dedicated to 'Smart Agri Hubs Hackathon Support'. The aim is to host news and discussion around the hackathon, in such a way that the topic offers relevant knowledge and expertise to other hackathon initiatives.

Prize money

The prize money for the hackathon is determined in close collaboration of all stakeholders, defining the different contributions from SmartAgriHubs, the organisers as well as other public and private sources. Subsequently, this dedicated money is either made available by

SmartAgriHubs and/or others, as a means to support the winner(s) to further develop their prototype and prepare for the open call phase of SmartAgriHubs. It is up to the jury to either assign this money to one team, or divide it over several teams.

It is up to the hackathon organiser and/or the local DIH to create additional opportunities for participants to receive coaching, networking opportunities, funding etc.

Judges

The hackathon organisers are assigning specific judges to the hackathon. Those judges shall be independent and impartial with respect to the participants in the hackathon. The organisers shall assure that those judges cover different type of expertise like the following:

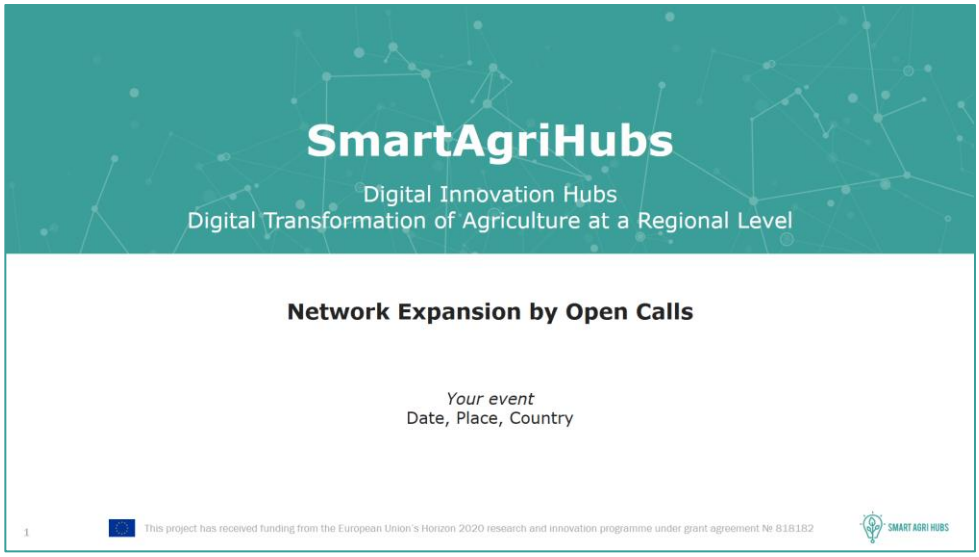
- Innovation management and startup acceleration specifically with respect to EU trends and legislation
- Regional/national expertise with respect to AgriFood related challenges and opportunities
- Technical expertise with the main lines of topics addressed in the hackathon
- Finance, banking and/or funding entity
- Administrative procedures and related eligibility criteria
- If applicable also expertise on internationalisation as well as on global agricultural strategies and trends

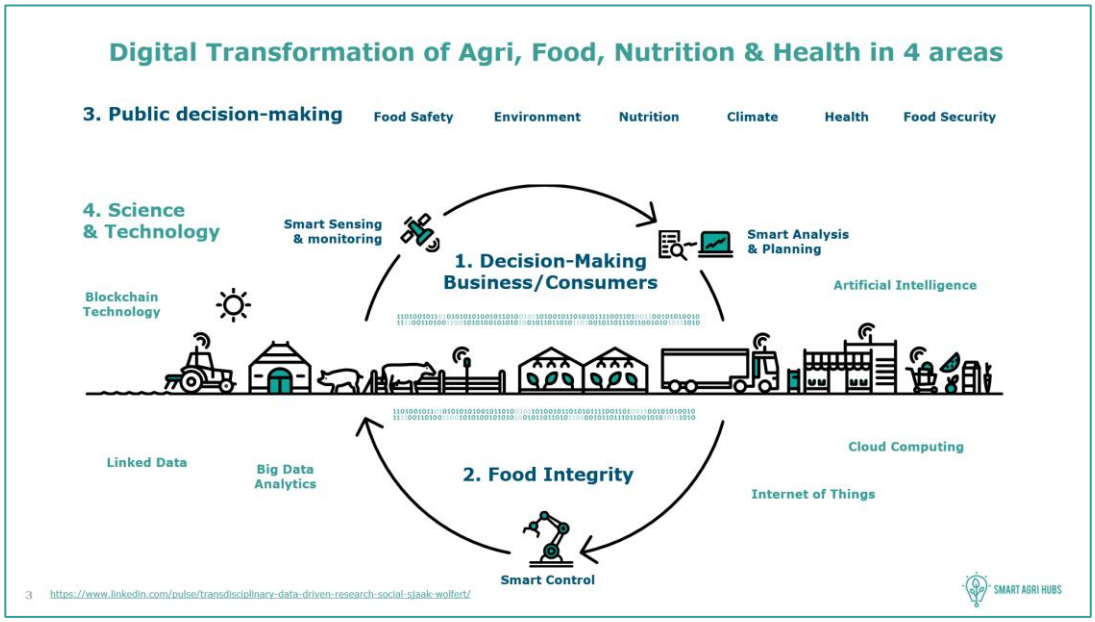
Judging criteria

Smart Agri Hubs is looking to unleash the innovation potential for the digital transformation of the European Agrifood Sector. Hackathons are dedicated events that can help to attract creative tech talent to work on longstanding challenges in agriculture. At the hackathon, submissions will be judged on the following criteria:

1. ***Potential impact on agriculture:***
   what is the impact of the initiative for farmers and the likelihood of adoption?
2. ***Building block vs. end product:***
   is the initiative a building block/platform that allows others to use the data, analyses, functionality in their own solutions by way of e.g. well-documented APIs. Or, is the initiative a "standalone" end product (e.g. an app that does not allow (paid) data reuse by third parties.
3. ***Team:***
   is the team strong, cohesive and dedicated? Will this team succeed in executing the idea in a thorough manner?
4. ***Business viability/sustainability:***
   what is the probability that the idea/solution will succeed and become a healthy (commercial) initiative? Have potential (paying) customers been identified/lined-up? Investors?
5. ***Community forming/facilitating/driven vs. singular entity:***
   will the initiative kick-start/ facilitate/ empower a new or existing community?
6. ***Impact/scale:***
   big/global vs. small/local solution
7. ***Degree of "openness":***
   how open will the initiative be? Will it communicate with its customers through a public channel, will it provide publicly accessible (paid) APIs or will it be an open source project (that charges for services as a source revenue instead of selling licenses).

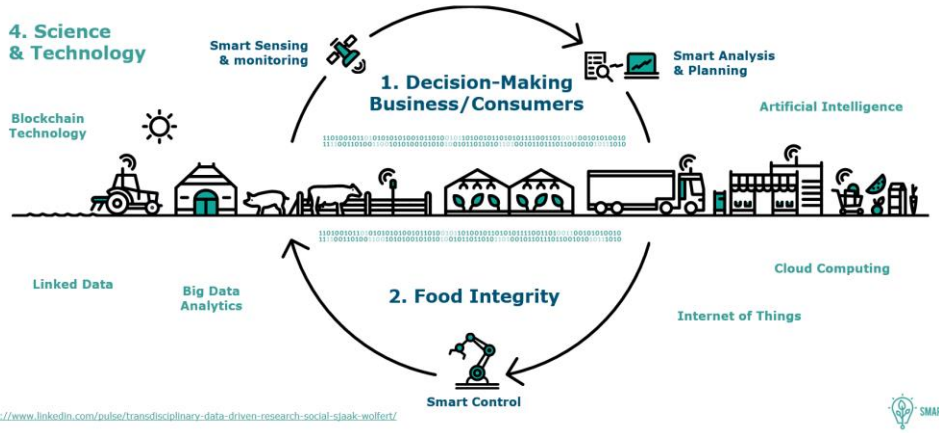
Annex 1.3 Presentation of SAH





Digital Transformation of Agri, Food, Nutrition & Health in 4 areas

3. Public decision-making Food Safety Environment Nutrition Climate Health Food Security



3 https://www.linkedin.com/pulse/transdisciplinary-data-driven-research-social-sjaak-wolfert/

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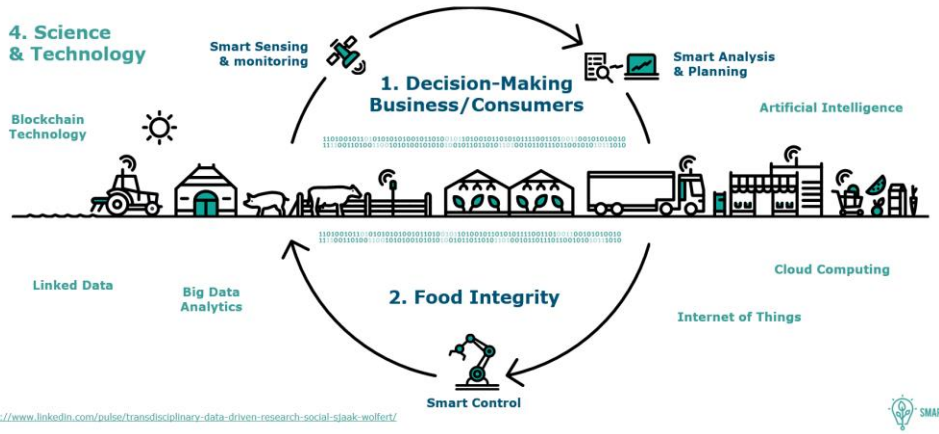
Digital Transformation of Agri, Food, Nutrition & Health in 4 areas

3. Public decision-making Food Safety Environment Nutrition Climate Health Food Security



3 https://www.linkedin.com/pulse/transdisciplinary-data-driven-research-social-sjaak-wolfert/

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Johan Bouma

Interview in Resource, 4 October 2018, p. 18-19

"You can't achieve the UN's sustainability goals through individual disciplines.
It is really important to get the stakeholders involved in the entire process.
It's not about us solving their problem, it's our joint problem that we need to jointly research in the knowledge that there are no direct solutions."

- Multi-disciplinary
- Collaborative process
- Agile development

5

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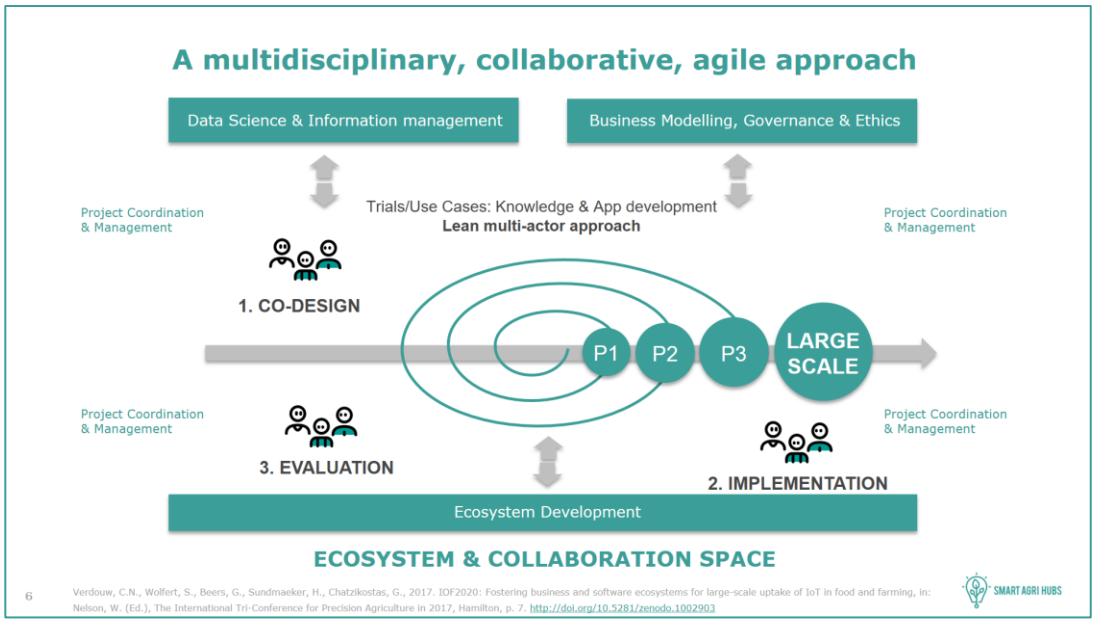
A multidisciplinary, collaborative, agile approach
Data Science & Information management
Business Modelling, Governance & Ethics
Project Coordination & Management
Trials/Use Cases: Knowledge & App development
Lean multi-actor approach
Project Coordination & Management
1. CO-DESIGN
P1
P2
P3
LARGE SCALE
Project Coordination & Management
Project Coordination & Management
3. EVALUATION
2. IMPLEMENTATION
Ecosystem Development
ECOSYSTEM & COLLABORATION SPACE
6
Verdouw, C.N., Wolfert, S., Beers, G., Sundmaeker, H., Chatzikostas, G., 2017. IOF2020: Fostering business and software ecosystems for large-scale uptake of IoT in food and farming, in: Nelson, W. (Ed.), The International Tri-Conference for Precision Agriculture in 2017, Hamilton, p. 7. http://doi.org/10.5281/zenodo.1002903
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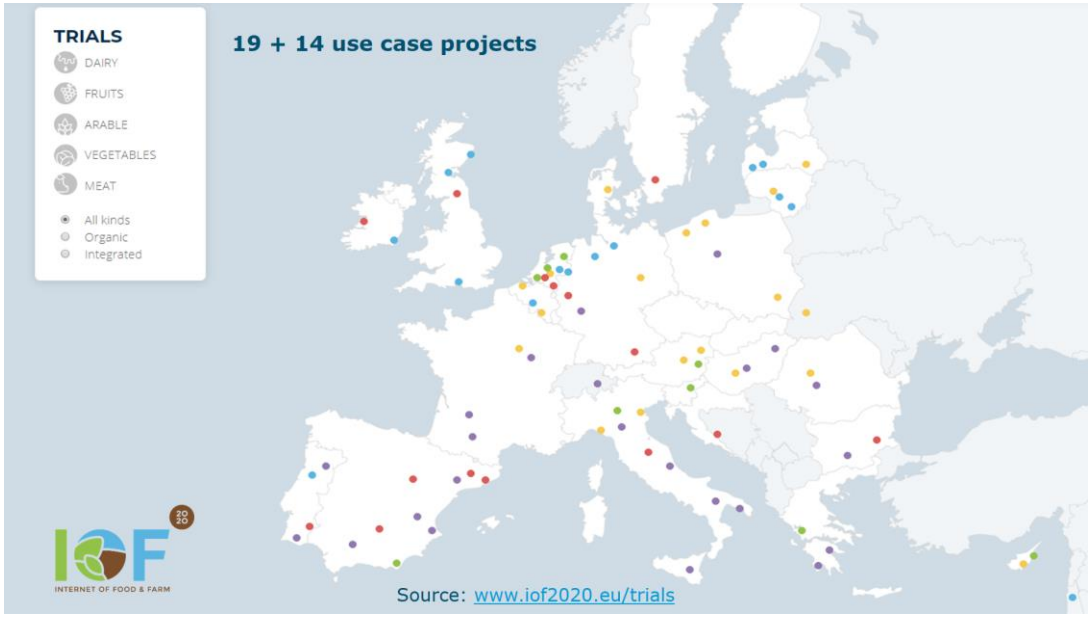
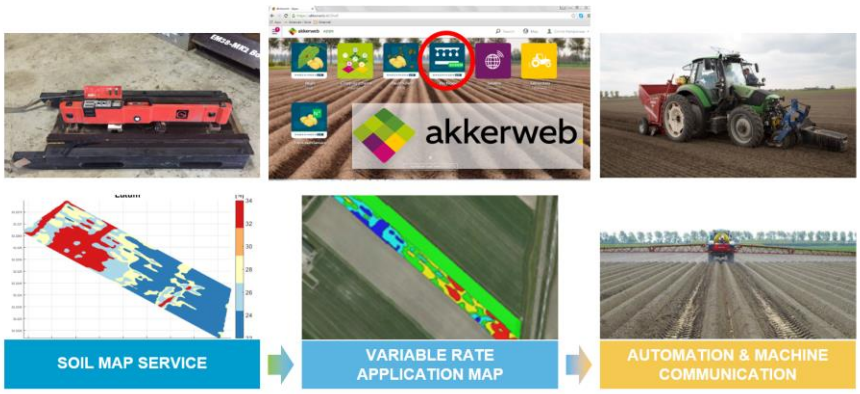

TRIALS
DAIRY
FRUITS
ARABLE
VEGETABLES
MEAT
All kinds
Organic
Integrated
19 + 14 use case projects
INTERNET OF FOOD & FARM
Source: www.iof2020.eu/trials


UC1.1. WITHIN-FIELD
MANAGEMENT ZONING
Soil map based variable rate applications and machine automation in potato production
Coordinators: Peter Paree (ZLTO) & Corné Kempenaar (WUR)
Bayer CropScience
GRIMME
kverneland group
ZLTO
WAGENINGEN
kpn

Product Impressions



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Product Factsheet

High spatio-temporal monitoring dashboard

Service

Variable Rate Application Map Service

Smart application of resources: seeds, pesticides, fertilizers

Customer & Provider

Business model

Farmers and advisors

Price per unit

Data-, service, infra-, knowledge providers

Major Challenge

Existing variable rate maps are often based on tweaking expert judgement and lack a certain level of precision in tasking / lack of validation.

Core Product Features

Minimum Viable Products

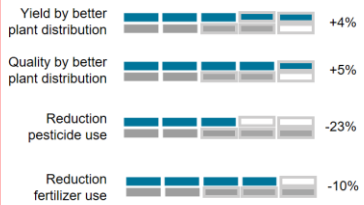
Variable planting distance map – Validation in 2017 and 2018. Nov. 2018 portal where maps can be ordered.

Variable rate herbicide use map - Validation in 2016 and 2017. May 2018 portal where maps can be ordered.

VRA additional N spraying June 2018 on Growth + Soil Maps.

Added Value

Here is what we aim to improve (KPIs)



Better distribution of plants leads to +5% kilos and +5% better quality (more potatoes in desired size). Taking soil characteristics for weed growth into account: -23% less herbicide and +2% more yield.

Enriching canopy index with soil characteristics lead to -10% less additional N fertilizer (2nd phase).

These values derive from comparison of a standard farm's performance prior to the installation of our system and after.

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Overall objective

Consolidate and foster EU-wide network of Ag DIHs to enhance digital transformation for sustainable farming and food production

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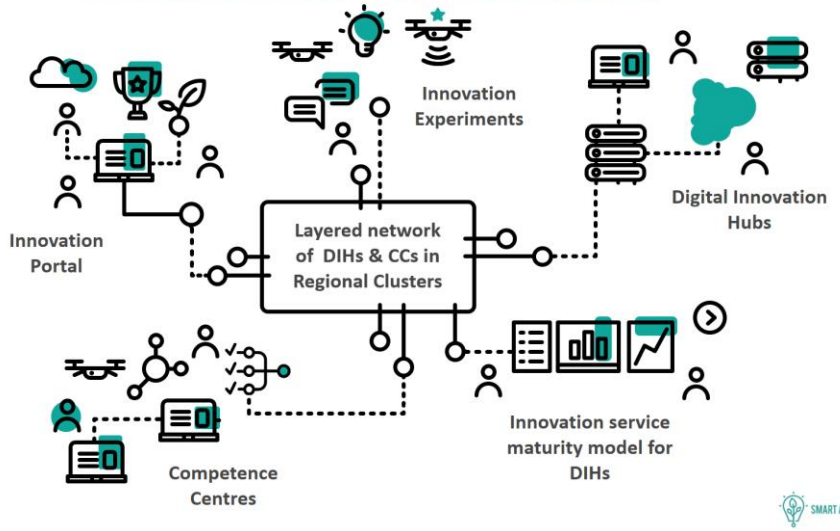
The 5 basic concepts of SmartAgriHubs



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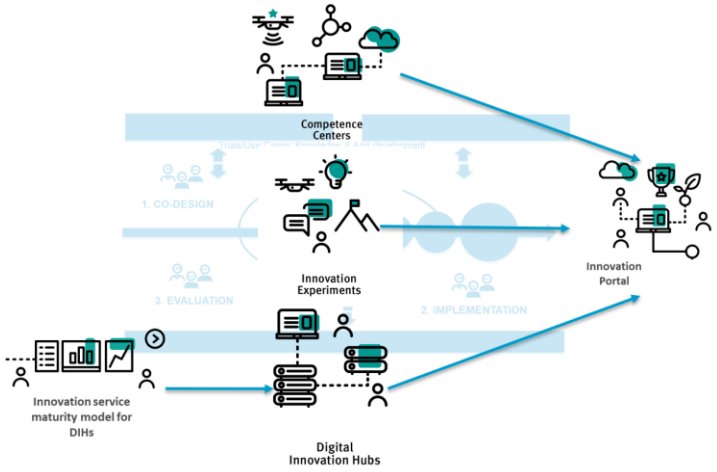
Where IoF2020 stops... and SmartAgriHubs continues



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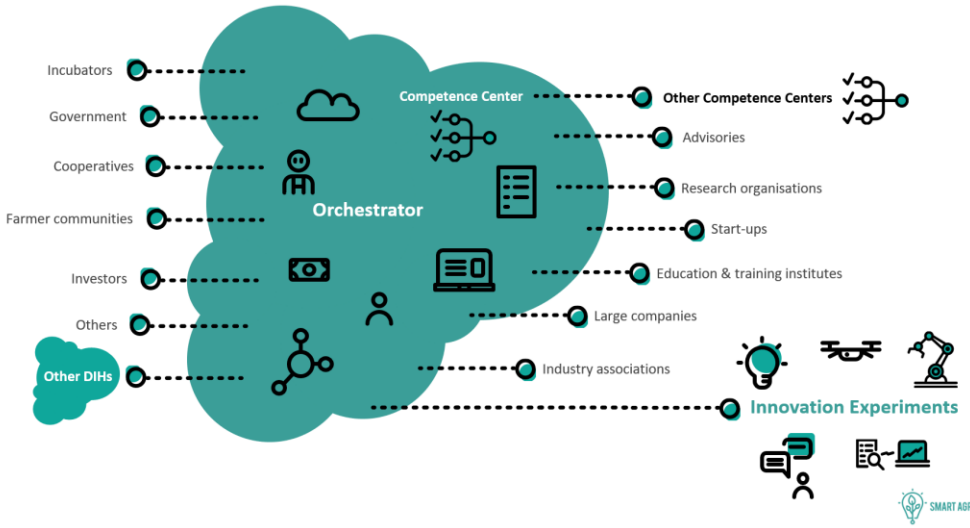
Digital Innovation Hub – local one-stop shop



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DIH innovation services

Ecosystem

- Community building
- Strategy development
- Ecosystem learning
- Project development
- Lobbying

Technology

- Strategic RDI
- Contract research
- Technical support on scale-up
- Provision of technology infrastructure
- Testing and validation

Business

- Incubator/accelerator support
- Access to finance
- Skills and education

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Challenge of SmartAgriHubs: Expand!

Ecosystem

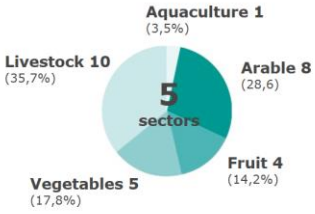
108 Partners
Involved covering all EU
68 partners are SMEs
54% of budget allocated to SMEs

Digital Innovation hubs

140 DIHs in the existing Network covering all **28 Member States**
Regional Approach
9 Regional Clusters
Attract **260 New DIHs**

Flagship innovation experiments

28 FIEs
22 Countries involved
13 Cross-border collaboration FIEs (47%)



Impact

24M additional funding
Mobilized from other sources(public, regional, national and private)
80 new digital solutions
Introduced into the market
2M Farms involved in digitisation

Open Calls

6M Euros distributed through Open Calls
75% Open Call budget to SMEs
70 New Innovation Experiments

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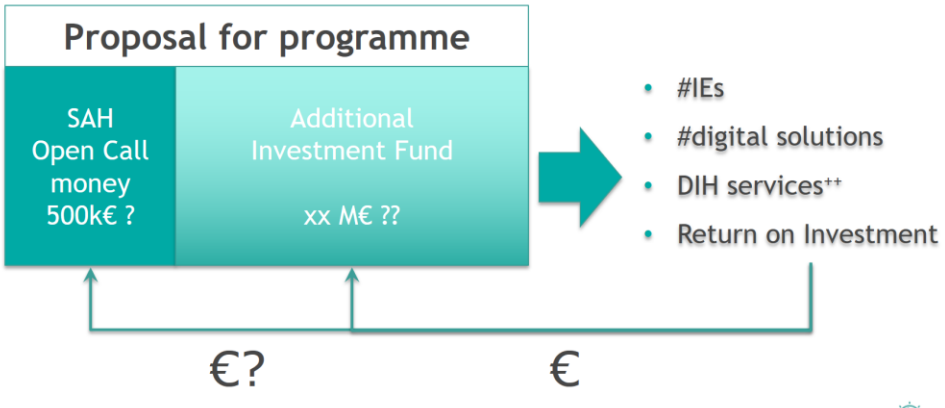
Open call for proposals - preliminary ideas!



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Possible, typical outline of a proposal

- Consortium of DIH(s) and fund(s) (+ SMEs?)
- Addressing a certain region (small or cross-country?)
- Addressing certain thematic priorities (sector, …)
- Approach (re-do SAH?)
  - FIEs as kick-starters, leading examples
  - Challenges, hackathons, to identify new IEs → matchmaking
  - …
- → should enhance DIH services!!

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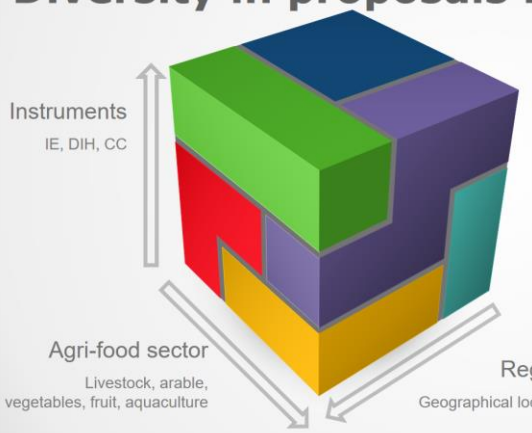
Diversity in proposals is expected



KPIs:

- >70 New Innovation Experiments
- 6 M€ SmartAgriHubs Funding
- Leverage with external public & private funds aiming at **mobilising additional 24 M€**

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SmartAgriHubs challenges - another idea

To allocate the remaining 500k€ as 'prize money'

- Hackathons/datathons, …

For those DIHs that didn't make it for the open call
But also to prepare for future SmartAgriHubs calls?

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Preliminary time path open call

- Until April 2020: preparation, setting thematic priorities
- **30 April 2020: official launch open call ????**
  - Announcement co-locating with an event?
  - Synergies for match-making, by a harmonised approach all WPs
- Until end of summer (August): proposal submission
- Q4-2020: Evaluation and selection of proposals
- 2021-2022: proposal implementation (could partly go beyond 2022, without central SAH support)

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Our offer:

- Existing DIH network
  - SMEs/start-ups/scale-ups
- Network of Competence Centres
- Flagship Innovation Experiments (> 60 incl. IoF2020)
- Excellent, well-equipped support team
- 6M€ SAH money

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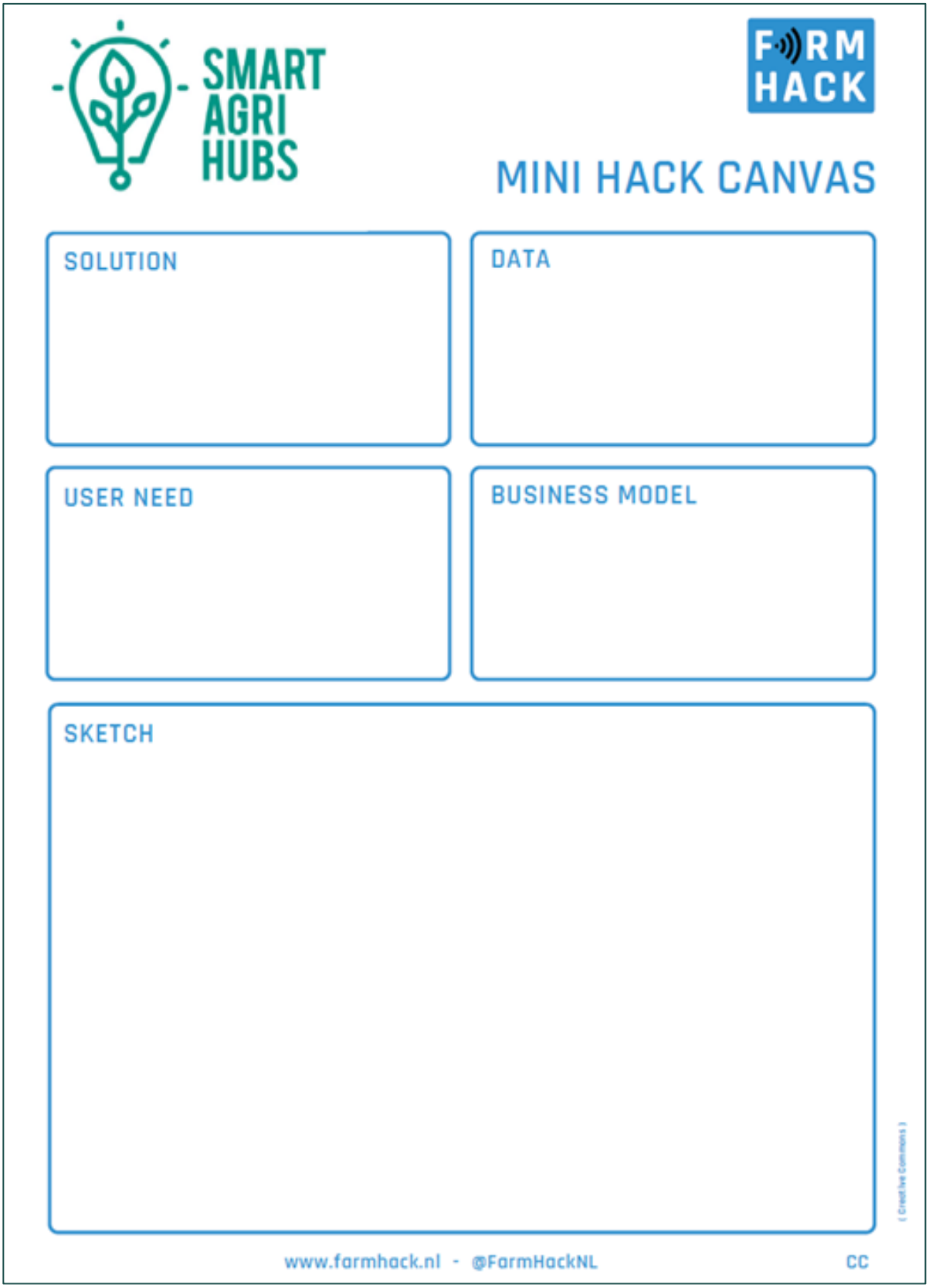
Annex 1.4 Mini Hack CANVAS

The Mini Hack CANVAS was developed for peer to peer work sessions during workshops. The usage usually results in concrete ideas and directions for follow-up activities, while linking the relevant stakeholders.



Annex 1.5 Format Reporting on a Regional Challenge

FORMAT REPORT ON REGIONAL CHALLENGE

[If your challenge is a hackathon, see instructions next page]

A. General Information

- Name and Date of event:
- Organizers:
- Number of participants:
- SAH DIHs and Expert Centres present:
- Type of participating organizations (and number per type):
    - Tech service providers
    - Knowledge and Research Centres
    - Bank/ private funding
    - Government
    - Farmers organizations
    - Other Food Business (non-farmers)
    - NGO
    - Other

- FIEs running in the region [If were present at the meeting]:
    - Number of FIEs:
    - Technologies involved:
    - Weak points identified in the development of these projects (technological, organizational, financial)

B. Regional, Sectoral and Technical Problems, Needs, Requirements and Opportunities

List of regional, sectoral and technical problems, needs and requirements and opportunities identified in this event to be taken into account for open call:

[You can give additional information / explanation in the annex. This information should explain the need in relation to the agri-food characteristics and market conditions of the region and level of technology adoption]

In order of importance:

1.
2.
3.
4.
5.

C. White Spots

If you as a DIH would have 1 Million € funding, what would you use them for? Please indicate % and give some additional explanation.

- Improving services provided by the DIH (___ %)
- Acquiring digital infrastructure (___ %)
- Dissemination activities (___ %). For what purpose?
    - Attract investors
    - Trigger more IEs
- Foster new IEs (___ %)
- Summing up with private investors to launch new initiatives (___ %)

D. Funding Opportunities

Please indicate funding opportunities that are either public or private. Identify also main hinders for access to this funding.

E. Ideas

Identify ideas that appear to have clear problem ownership and possible impact on agriculture/food sector [include their mini hack canvas in the annex to this form, if available].

F. Possible next steps

Follow up events: hackathons, ideas for other innovation experiments, accelerator programs

In case you are organising a hackathon:

You can report the general items under A. Skip the question on FIEs.

Instead of B: Report on the following and give reasons why the winners were selected.

- Report on the teams that are present (and which topics they worked on).
- Report on the winning teams (give also reasons why they were selected).

Report on F (in relation to the outcomes of the hackathon and/or your region).

Report on D (in relation to the outcomes of the hackathon and/or your region).

Report on C.

ANNEX 2

Annex 2.1 Hackathon of NIK Academy, Bulgaria

- ***Challenge 1:***
  Beekeeping Technologies. How can farmer friendly websites or apps help in the protection of bee families? For example, can spray alert apps warn beekeepers about pesticide use? Or can we help 'bee shepherds' by mapping out available food sources for their bee-herds? What insights could you provide citizens by having an 'internet of bees'?
- ***Challenge 2:***
  IoT Agro Automation. The challenge is how to present IoT data from different standalone/fragmented sources in a simple way to create actionable insight for farmers. What visualizations will make data simple, usable and readable for the farmer? Alternatively, can you find a way to measure processes that are not being measured now using IoT? Are you an expert in an IoT hardware solution and do you have any ideas of how to bring this device to agriculture? How can farm-based IOT devices contribute to the automation of farming operations and decisions?
- ***Challenge 3:***
  Agricultural Machine Data. This challenge taps into the existing machine data and the new dutch ISOBlue initiative. Participants are challenged to provide insight to farmers from their very own tractor data. The aim is to increase the ease of use and the interchangeability of tractor data from the standard display, from GPS and ISOblue. Alternatively, hardware lovers can build a Bulgarian equivalent of the dutch ISOblue. It is a problem that integrates options for hardware/software, data handling, data governance, visualization and a cross-country collaboration.
- ***Challenge 4:***
  Artificial Intelligence in Agriculture. How can the farmer and the machine (think robots and algorithms) be combined to yield either faster, more scalable results or more tailored, customized farming solutions? How can agricultural robots tackle tasks such as harvesting with greater speed and higher yields? For example, how can computer vision contribute to individualized feed intake for animals or customized chemical application for weeds? How can remote sensing and AI help create prediction models for weather related risks or pinpoint areas with threatened forest species?
- ***Challenge 5:***
  Satellite Data Track. Can you optimize the cloud and shadow detection algorithms from satellite and space data? If there are areas of an image that are unusable due to clouds or shadows, make those areas excludable, let the system know that it shouldn't make any agricultural assumptions or calculations based on that area of the image.

Annex 2.2 Wageningen Life Science Hack

- ***Challenge 1:***
  Feeding algorithms. Dairy innovator Lely and software company Rovecom challenge you to hack their algorithms for nutritional advice and ration optimization. For the hackathon the two companies have compiled a unique dataset with thousands of cows. This opens an array of possibilities to determine correlations between feeding and cow health, and possibly find new ones!
- ***Challenge 2:***
  Machine data IOT. The Niva challenges you to help farmers use their machine data to automatically prove compliance for catch crops. This challenge is about 'short data loops', 'smooth' application processes, innovative reuse of machine data, and even data governance!
- ***Challenge 3:***
  Digital Phenotyping. Hendrix Genetic, targeting better breeding challenges you to identify relevant environmental data to predict phenotype. For this challenge, a unique and unusually rich dataset is compiled to provide insight into this complex interaction.
- ***Challenge 4:***
  Product Chain. Unilever is pushing the sustainable living agenda and is looking for innovators who want to work on the foods of tomorrow. The huge amount of publications & patents with specific data on the Maillard reaction out in the open domain might give new insights and potential if efficiently processed (read, relevant data extracted and analysed).