



D2.1.1 TRIAL IMPLEMENTATION GUIDELINES

Tuesday, August 8, 2017



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1. SUMMARY

The deliverable 2.1.1 “Trial Implementation Guidelines” is the first deliverable of WP2, led by BioSense Institute and co-led by ILVO. The objective of this deliverable is to provide, in the first part, generic guidelines common to all the trials and use cases.

In the first section the general objectives of the projects are listed, the communication channels and the documentation standards are established. Moreover, precise role descriptions for each trial chair and use case coordinator are presented to ensure clear allocation of the work. As well, specific deadlines are provided for the trial chairs and use case coordinators, according to the deadlines of the work packages. The organization of the meetings at different level is additionally included in this section, establishing monthly meetings at use case and trial level and trimestral meetings at work package level.

The second section of the deliverable reports tailored guidelines for each trial and use case. This information was directly provided by trial chairs and use case coordinators to ensure the specificity of the guidelines. The cooperation with the use case coordinators and trial chairs showed their great proactivity and interest to establish concrete guidelines to ensure the smooth progress of the operations.

2. BACKGROUND

Aiming at boosting the competitiveness of European agriculture on a global scale, DG Connect and DG Agri of the European Commission are jointly investing €30 Million in a unique project that will accelerate the adoption of the “Internet-of-Things” concept in agriculture.

In IoF2020 “Internet of Food and Farm 2020” we coordinate activities of MORE THAN 70 European institutions including leading multinational companies such as Philips and ST Microelectronics. Internet of Things is the forefront of the currently happening 4th industrial revolution. By connecting live and virtual worlds, unprecedented possibilities for the development of agriculture are emerging. IoF2020 project connects IT experts, end-users from the agri-food sector, SMEs, and the largest European high-tech companies, with a common goal to create sustainable and highly productive European agriculture of the future. Researchers at IoF2020 will implement various IoT concepts at various pilot sites defined in all 5 areas of agriculture (arable, dairy, fruit, vegetables, and meat). Some of the systems to be developed include zone crop management, precise monitoring of nutrients and water, cattle monitoring and early detection of diseases, variable spraying and many more.

3. GENERIC GUIDELINES OUTLINING COMMON FEATURES AND PRACTICES FOR ALL TRIALS

3.1 GENERAL GOALS OF THE PROJECT

The main objective of the IoF2020 Project is to foster a large-scale take-up of IoT in the European farming and food domain. This will contribute to a next huge innovation boost and consequently to a drastically improved productivity and sustainability. This overall aim will be achieved by accomplishing the following specific project objectives:

- to demonstrate the business case of IoT for a large number of application areas in farming and food
 - IoF2020 has carefully selected 5 trials comprising 19 use cases that reflect the diversity of the agri-food domain and that are most comprehensive for application at scale and in operational conditions. The trials are embedded in an ecosystem that enhances large-scale take-up by active involvement of European and national communities, both from the demand-side and supply-side of IoT
- to integrate and reuse available IoT technologies by exploiting open architectures and standards
 - The trials will integrate a multitude of technologies covering the entire IoT value chain. Existing components are reused as much as possible and, if necessary, adapted to the specific user requirements. Reuse beyond use cases is especially supported by the IoF2020 catalogue and the IoF2020 lab. All Use cases and reusable IoT components will be based on open IoT standards, architectures and platforms in order to ensure interoperability (including IoT-A, FIWARE, CRYSTAL, SOFIA, EPCIS). Furthermore, interaction between use cases during deployment is supported by the IoF2020 Collaboration Space, which will be based on FIspace, i.e. the agri-food Domain Specific Enabler of FIWARE.
- to ensure user acceptability of IoT solutions in farming and food by addressing user needs, including security, privacy and trust
 - A demand-driven approach with the active involvement of end-users is deeply embedded in IoF2020. The trials are user-driven from the very beginning and pay a lot of attention to user acceptability and organizational bottlenecks for adoption, deployment and commercialization of IoT in the agri-food. We have defined specific KPIs on validation of user acceptability. The Security & Privacy Impact and Liability of each use case will be assessed by experts and use case participants will be coached and trained in security, data ownership, privacy, liability and ethical issues.
- to ensure the sustainability of IoT solutions beyond the project by validating the related business models and setting up an IoT ecosystem for large scale take-up.

- the central objective of IoF2020 is to foster a large-scale take-up of IoT in the European farming and food domain and the commercial success beyond the project is considered as a fundamental focus. As a consequence, the use cases will develop, improve, and validate their business models from the very beginning. They will be trained and mentored intensively in doing this. Furthermore, the viability of the business models will be assessed by experts.

3.2 DOCUMENTATION GUIDELINES

The documentation must be filled in according to the directions of the Project Coordinator.

All the official documents of the IoF2020 Project should use the template provided by the project coordinator, which is the one used for this deliverable. The chosen text font is Arial 12, with different sizes for the headings. The colours used in the documents should follow the three main colours of the IoF2020 project logo (green, light blue and brown).

3.2.1 Documentation provided for the deliverable

The goal of the deliverable “Trial Implementation Guidelines” is to define general and specific guidelines for IoF2020. To accomplish the goal of the deliverable, WP2 team has prepared several documents that will ease the implementation of the guidelines.

The documents prepared are:

- table with partners’ contacts
- templates for the minutes of the meetings (annex)
 - one template for the use case level meetings, including a section for the evaluation of the KPIs, measuring the environmental, economic, and social impact of the use case
 - one template for the trial level meetings, including a section for evaluating the impacts of the trial
 - one template for the WP level meetings
- table including all the KPIs of the 19 use cases. This table will be further updated with new and more specific KPIs
- table containing all the deadlines for the use case coordinators and trial chairs, regarding the deliverables of WP2
- template for the agendas, which will be used for scheduling the activities, timeslots and the participants to the meetings of IoF2020 Project (annex)

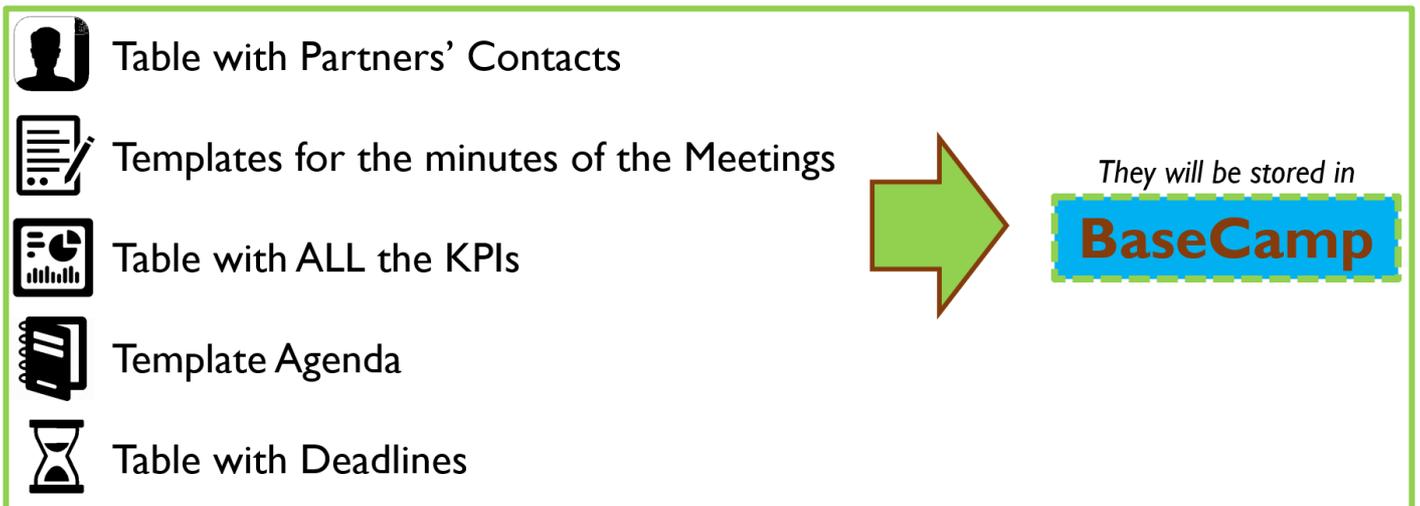


Figure 1 - Documentation provided by WP2 for the D2.1.1

3.3 COMMUNICATION CHANNELS

The establishment of specific communication channels will ease the exchange of information and documents among partners. Considering the internationalization level of the Project, there is a need for specific guidelines for the communication channels.

The main communication channels used are:

- BaseCamp as a collaboration software at project level. Here will be placed and stored:
 - Minutes of the meetings at WP, Trial and use case level
 - Time-sheets for scheduling meetings
 - Templates for agendas and meeting's minutes
 - Important documents and reports
- E-mail: it is the most suitable channel for daily and frequent communications, as well for documentation and information exchange;
- Google Doc: it is useful to create and share folders in google doc when it is necessary to collaborate on the production of documents. It is suggested that each Trial and use case has its own shared folder. This will enable all partners to have access to the shared documents and information;
- Skype (or other software): used for the majority of the aforementioned project meetings, due the impossibility of numerous physical meetings. The coordination and the set up of the TELCOs can be done through the use of doodles or timesheets
- Physical meetings: such as the Kick-Off Meeting (KOM) and the consortium meetings. They represent a great opportunity for evaluating and discussing the overall progress of the IoF2020 Project.

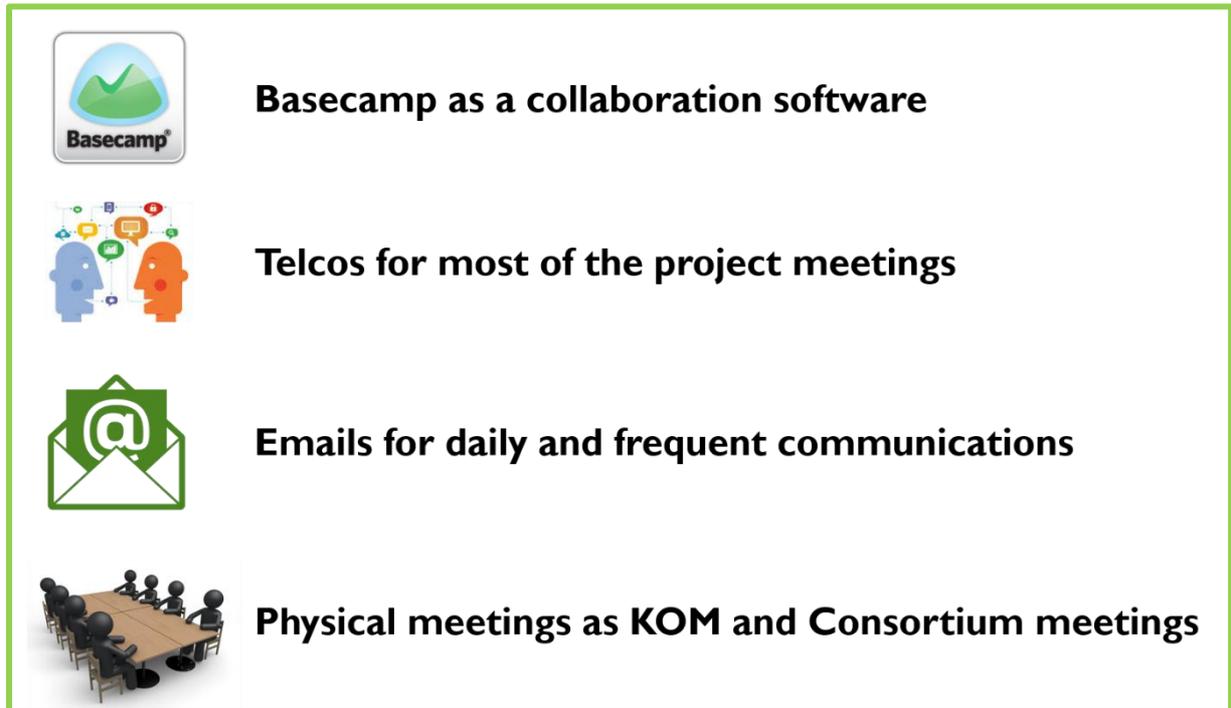


Figure 2 - Most suitable communication channels for IoF2020 Project

3.4 TRIAL STRUCTURE

Each trial of the IoF2020 project is headed by a team of three Chairs: Technical Chair, Business Chair, and Ecosystem Chair. Strategic decisions at trial level are facilitated through an inclusive and collective decision making mechanism, where two out of three votes are required to make a strategic decision.

Technical Chair	Business Chair	Ecosystem Chair	U.C. Coordinator
<ul style="list-style-type: none"> Collecting and Reporting KPIs measuring the Environmental Impact Report the technological progress of the Trial Cooperate and Liaise with WP3 Participate to the scheduled Meetings 	<ul style="list-style-type: none"> Collecting and Reporting KPIs measuring the Economic Impact Report the economic progress of the Trial Cooperate and Liaise with WP4 Participate to the scheduled Meetings 	<ul style="list-style-type: none"> Collecting and Reporting KPIs measuring the Other (Social) Impact Report the dissemination, demonstration and feedback collection progress of the Trial Cooperate and Liaise with WP5 Participate to the scheduled Meetings 	<ul style="list-style-type: none"> Provide reports about the assigned U.C. to the Chairs and WP2 Collect and Analyse the KPIs Manage and Coordinate the U.C. Activities Schedule the U.C. meetings Participate to the scheduled Meetings

Figure 3 - Overview of the trial chairs and use case coordinator roles

3.4.1 Technical chair role description

The role of the Technical Chair includes the following tasks:

- Collecting and reporting to the WP2 leader (BioSense) and co-leader (ILVO) the **KPI's** measuring the **environmental impact** of the use cases within the assigned trial as established in the Final Proposal of the IoF2020 project;
- Report periodically, to the leader of WP2 (BioSense) and the co-leader (ILVO), the technological progress of the use cases within the assigned trial;
- Actively participating in the strategic decisions of the assign trial with the Business chair and the Ecosystem Chair;

- Cooperate and liaise with WP3 (IoT Integration and Capabilities) providing the needed information to secure that the envisaged objectives established in the final report of the IoF2020 project, are reached
 - WP3 guides use cases how to leverage existing IoT technologies, approaches, methodologies and guidelines, and facilitate collaboration between use cases.
 - WP3 supports the use cases in enhancing & configuring their existing IoT platforms and by hosting an experimentation/testing environment to be used during the basic development, integration and experimentation phase.
 - Communicate the feedback from end users to the solution providers and to coordinate the technical improvement process
- Coordinate the technological improvements resulted from the translated key issues demanded by end-users and stakeholders within the assigned trial.
- Participating at all the trial-package meetings (1 meeting a month (TELCO)), WP meetings (1 every quarter (TELCO)) and consortium meetings.

3.4.2 Business chair role description

The role of the Business Chair includes the following tasks:

- Collecting and reporting to the WP2 leader (BioSense) and co-leader (ILVO) the **KPI's** measuring the **economic impact** of the use cases within the assigned trial as established in the Final Proposal of the IoF2020 project;
- Report periodically, to the leader of WP2 (BioSense) and the co-leader (ILVO), the economic progress of the use cases within the assigned trial;
- Actively participating in the strategic decisions of the assign trial with the Technical chair and the Ecosystem Chair;
- Cooperate and liaise with WP4 (Business Support) providing the needed information to secure that the envisaged objectives established in the final proposal of the IoF2020 project, are reached
 - WP4 provides business support to each use case of the 5 trials
 - WP4's goal is to assess the market readiness, define business models and prepare the market entry for each of the new technologies adopted in the use cases
 - WP4 will implement a Business Intelligence System (BIS) for monitoring the success of the use cases;

- Acts strategically to assure that the business goals of the assigned trial are reached, establishing a productive communication and collaboration with the use case coordinators.

Participating at all the trial-package meetings (1 meeting a month (TELCO)), WP meetings (1 every quarter (TELCO)) and consortium meetings.

3.4.3 Ecosystem chair role description

The role of the Ecosystem Chair includes the following tasks:

- Collecting and reporting to the WP2 leader (BioSense) and co-leader (ILVO) the **KPI's** measuring the **other impact (social, etc.)** of the use cases within the assigned trial as established in the Final Proposal of the IoF2020 project;
- Report periodically, to the leader of WP2 (BioSense) and the co-leader (ILVO), the dissemination, demonstration and feedback collection progress of the use cases within the assigned trial;
- Actively participating in the strategic decisions of the assigned trial with the Technical chair and the Business Chair;
- Cooperate and liaise with WP5 (Ecosystem Development) providing the needed information to secure that the envisaged objectives established in the final proposal of the IoF2020 project, are reached
 - WP5 provides dissemination and demonstration support to each use case of the 5 trials
 - WP5's goal is to create and strengthen a sustainable ecosystem for the long-term application and appreciation in society of IoT technologies
 - Communicate the results of the use cases to the broader public and collect end-user and stakeholder feedback to support the technology development
- Coordinates the communication, dissemination and demonstration activities of the assigned trial, ensuring co-creation and involvement of end-users
- Participating at all the trial-package meetings (1 meeting a month (TELCO)), WP meetings (1 every quarter (TELCO)) and consortium meetings.

3.4.4 Use case coordinator role description

Each of the 19 use cases of IoF2020 project is headed and coordinated by a use case Coordinator. This function is of crucial importance for the well-functioning of the project itself, being the use case coordinators the connection point between the Work Packages, the Trials and each use case.

The role of the use case Coordinator includes the following tasks:

- With respect to the use case reports
 - Writing and/or co-writing all the reports of the assigned use case, paying particular attention that the quality of the documents matches the requirements described on the D2.1.1 “Trial Implementation Guidelines”
 - Providing the reports to the Trial Chairs of the assigned trial, as well to the WP2 leader or co-leader, **before the deadline**
- Collect and analyse the KPIs of the assigned use case and provide them to the right chair
 - KPIs measuring the environmental impact must be sent to the Technical Chair
 - KPIs measuring the economic impact must be sent to the Business Chair
 - KPIs measuring other impacts (i.e. social) must be sent to the Ecosystem Chair
- Act strategically to assure that the goals of the assigned use case are reached, establishing a productive communication and collaboration with the use case partners
 - Manage and coordinate the activities and operations within the assigned use case, being sure to avoid delays
 - Coordinate and motivate all the partners within the assigned use case to assure the smooth progress of the use case activities
 - Collect the KPI's from the partners within the assigned use case, avoiding delays and/or missing information
- Cooperate and liaise with the Trial Chairs of the assigned trial, providing the needed information to secure that the envisaged objectives established in the final report of the IoF2020 project, are reached
- Participating and **scheduling** all the use case meetings for the assigned use case (1 meeting per month is required)
- Participating to the trial-package meetings (1 meeting a month).

3.5 SCHEDULE OF THE MEETINGS

IoF2020 Project includes more than 70 partners; consequently, it is very important to schedule in advance the meetings at different levels. There is the need for meetings at three levels: use case, Trial and Work Package.

This structure of the meetings is coherent with the bottom-up approach, which is at the base of IoF2020 Project, where the information flow goes from the use cases, up to the work packages. As well, the three levels of meetings assure a multi-actor approach, where information are exchanged among all the partners and the feedback of the end users is taken into account and valorized for further improving the MVPs.

	<p>Use the official Agenda Template</p>
	<p>Use the official Minutes Templates</p>
	<p>Upload the documentation on Basecamp</p>

Figure 4 - General requirements for the meetings

The meetings are structured as follow.

One **monthly meeting** for **each use case**. Including:

- use case coordinators
- use case partners

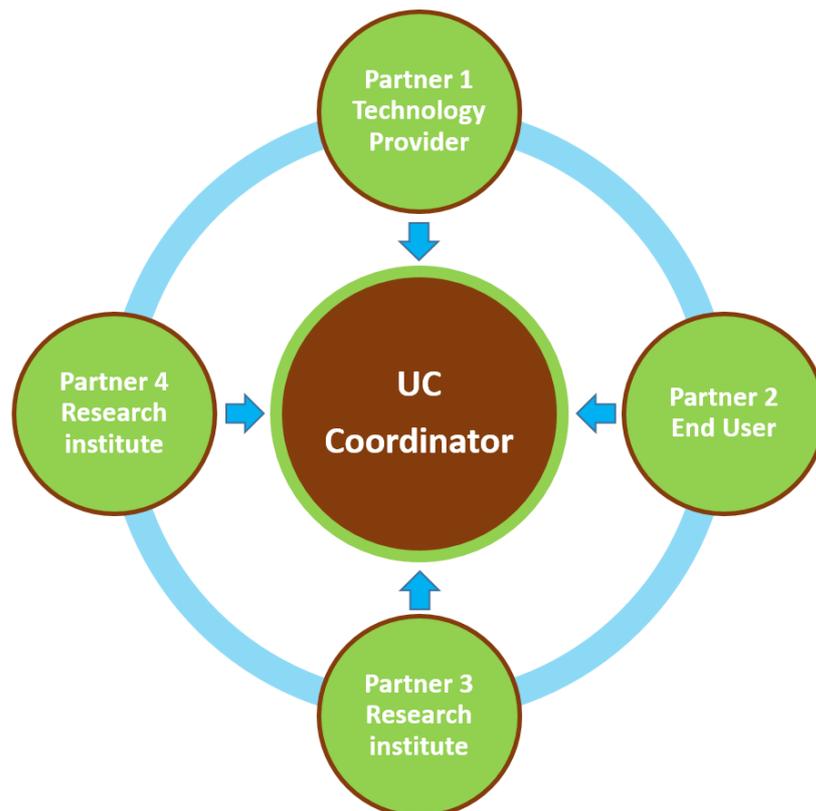


Figure 5 - Concept graph of the use case level meetings

The scopes of this meeting are:

- easing the coordination of the use case
- assuring the follow up of the activities
- allowing the use case coordinator to solve possible problems on time
- assuring constant KPIs evaluation for each use case

The **use case coordinator** is responsible to schedule the monthly meeting, as well to take the minutes of the meetings, using the template provided by WP2.

One **monthly meeting** at **trial level**. Including:

- the trial chairs of the assigned trial
- use case coordinators of the use cases within the trial,
- WP2 leader or co-leader



Figure 6 - Concept graph of the trial level meetings

The scopes of this meeting are:

- strengthening the collaboration between WP2, trial chairs and use case coordinators
- allowing a bottom-up approach to problem solving
- WP2 is constantly updated on the trials and use cases' status
- Assuring monthly communication between trial chairs and use case coordinators within the assigned trial

WP2 is responsible to schedule the trial level meeting. Furthermore, WP2 is tasked with taking the minutes of the meetings and assure that such documents are sent to the trial chairs and the use case coordinators.

One meeting **every quarter** at **work package level**. Including:

- WP2 leader or co-leader,
- WP3 leader,
- all the technical chairs

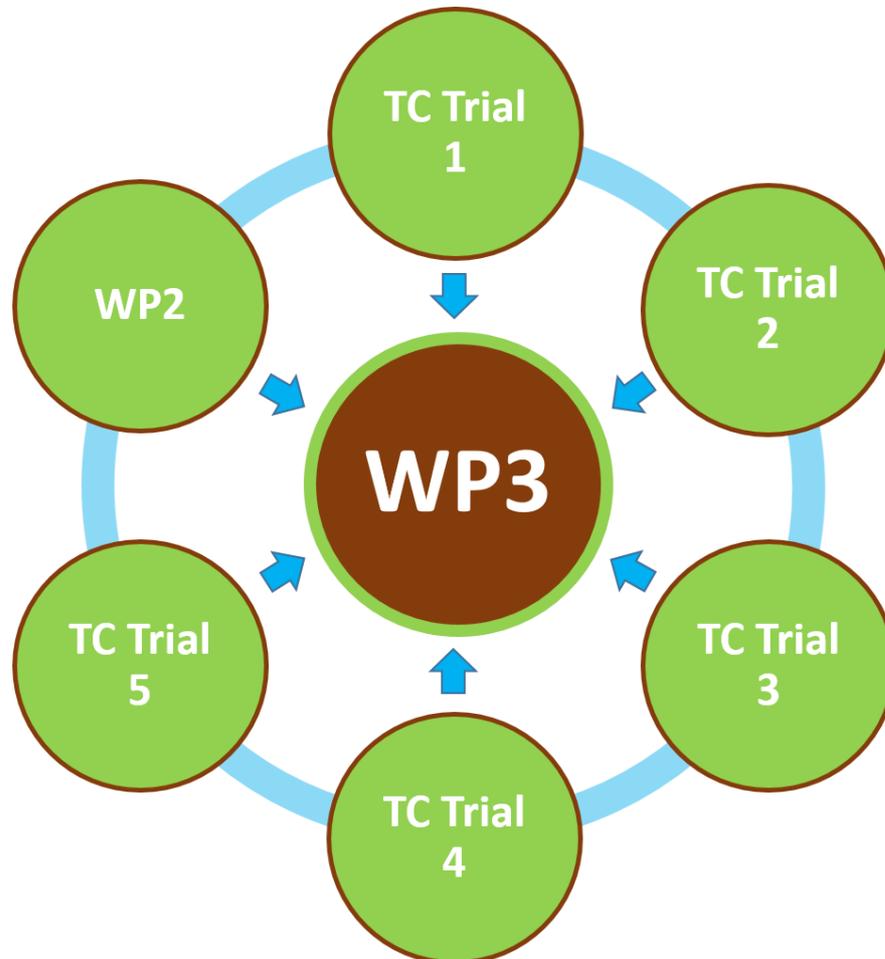


Figure 7 - Concept graph of WP3 level meetings

The scopes of this meeting are:

- assuring a periodic evaluation of the environmental impact of IoF2020,
- connecting the WP3 with the technical chairs of all the trials, providing a mean of comparison between the five trials and enhancing possible cooperations for a more significant impact
- ensuring the evaluation of the KPIs, measuring the environmental impact, by WP3, as expected through the bottom-up approach

WP3 is responsible to schedule the trial level meeting. Furthermore, WP3 is tasked with taking the minutes of the meetings and assure that such documents are sent to the technical chairs and to WP2.

One meeting **every quarter** at **work package level**. Including:

- WP2 leader or co-leader,
- WP4 leader,
- all the Business chairs

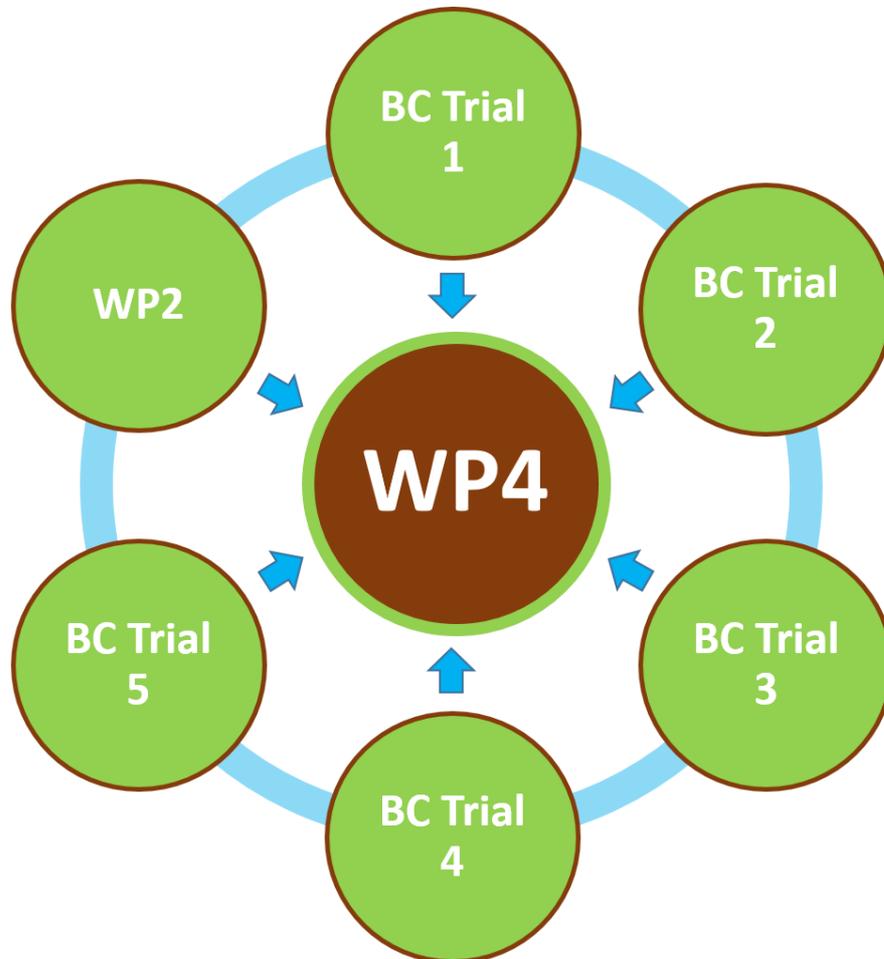


Figure 8 - Concept graph of WP4 level meeting

The scopes of this meeting are:

- assuring a periodic evaluation of the economic impact of IoF2020,
- connecting the WP4 with the business chairs of all the trials, providing a mean of comparison between the five trials and enhancing possible cooperations for a more significant impact
- ensuring the evaluation of the KPIs, measuring the economic impact, by WP4, as expected through the bottom-up approach

WP4 is responsible to schedule the trial level meeting. Furthermore, WP4 is tasked with taking the minutes of the meetings and assure that such documents are sent to the business chairs and to WP2.

One meeting **every quarter** at work package level. Including:

- WP2 leader or co-leader,
- WP5 leader,
- all the ecosystem chairs

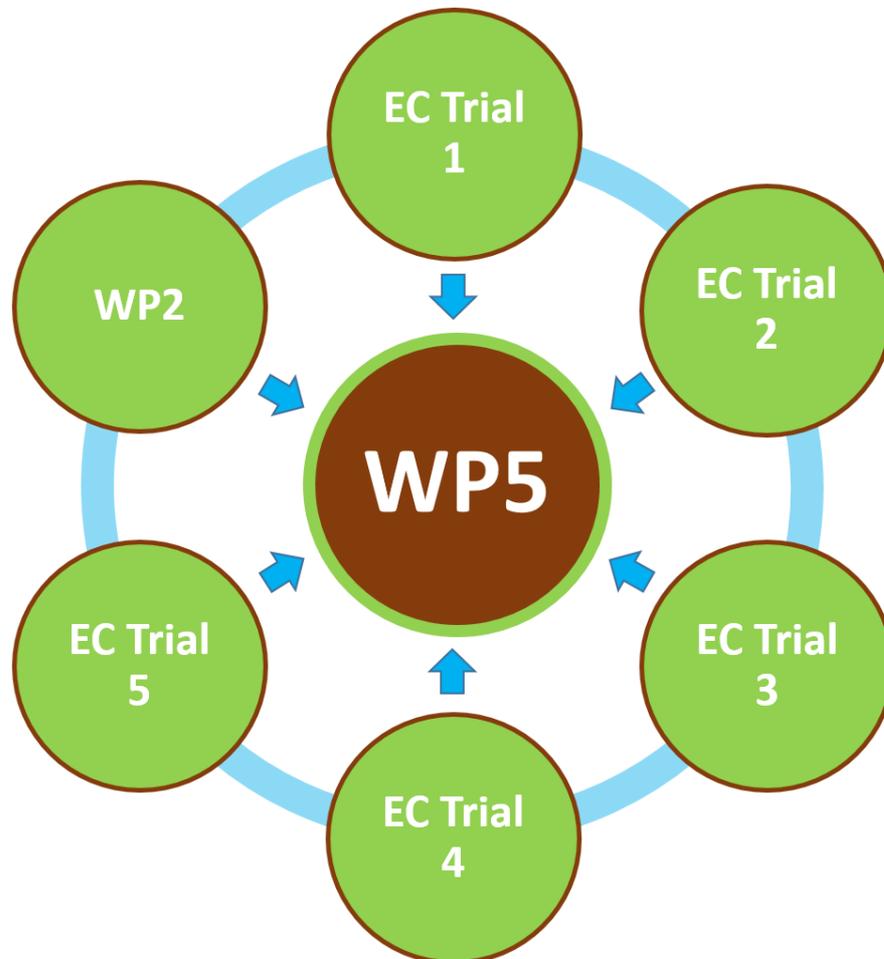


Figure 9 - Concept graph of WP5 level meeting

The scopes of this meeting are:

- assuring a periodic evaluation of the social and other impacts of IoF2020,
- connecting the WP5 with the ecosystem chairs of all the trials, providing a mean of comparison between the five trials and enhancing possible cooperations for a more significant impact
- ensuring the evaluation of the KPIs, measuring the social and other impacts, by WP5, as expected through the bottom-up approach

WP5 is responsible to schedule the trial level meeting. Furthermore, WP5 is tasked with taking the minutes of the meetings and assure that such documents are sent to the ecosystem chairs and to WP2.

Use-case Meetings	Trial level Meetings	WP level Meetings
<p>Use-case Coordinator should:</p> <ul style="list-style-type: none"> • Call the meeting every month • Decide the platform for the meeting • Compile the minutes • Upload the minutes on Basecamp 	<p>WP2 Leader or Co-Leader should:</p> <ul style="list-style-type: none"> • Call the meeting every month for each Trial • Decide the platform for the meeting • Compile the minutes of the 5 meetings • Upload the minutes on Basecamp 	<p>WP3, WP4, WP5 Leaders or Co-Leaders should:</p> <ul style="list-style-type: none"> • Call the meeting every 3 months • Decide the platform for the meeting • Compile the minutes • Upload the minutes on Basecamp

Figure 10 - Overview tasks for the three level meetings

3.5.1 Standardization of the documents' names

Considering the great amount of documents that will be upload by each use case, trial and work package on Basecamp, there is the necessity for standardizing the name of the files. This process will make the search for the documents easier and will maintain a professional order in the different folders.

The standardization of the documents' names regards two types of documents:

- the agendas for the meetings (at use case, trial, and work package level)
- the minutes of the meetings (at use case, trial, and work package level)

The figure 11 shows the standardization of the documents' names, providing precise examples.

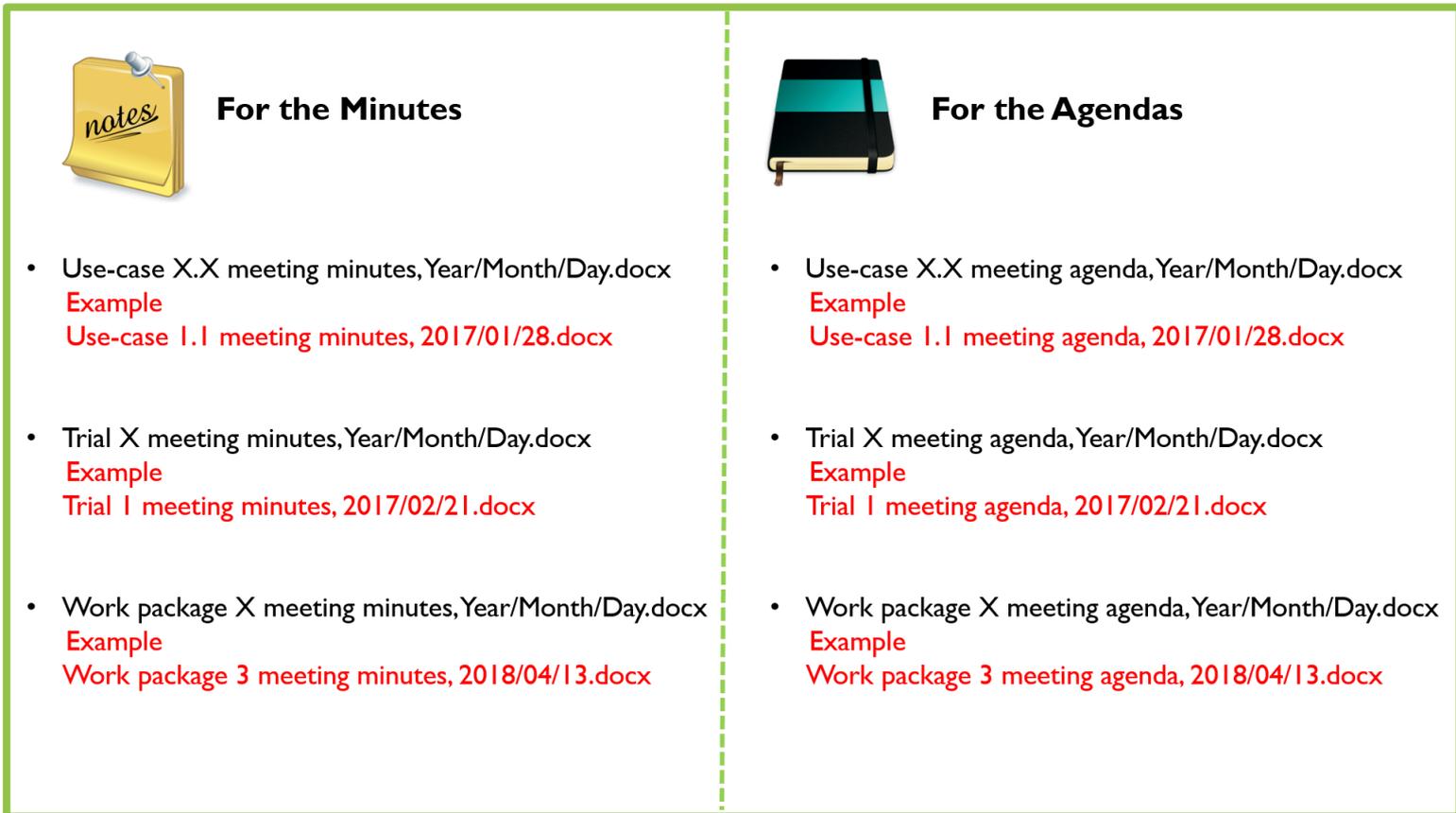


Figure 11 - Standardization of the file names for the agendas and the minutes

3.6 ANNUAL DEADLINES

It is crucial to respect the deadlines in order to ensure the smooth implementation of the Project, which is why it is important to schedule precise deadlines from the beginning of the project. Through this procedure, use case coordinators and trial chairs can have an initial overview of what is expected from them, and when it is expected.

Most of the deadlines will be related to the deliverables of the five work packages. Therefore, the documentation and information required by the WP leaders or co-leaders **must** be provided (by the trial chairs and/or the use case coordinators, depending on the case) **1 month before** the deadline of the deliverable at issue.

The table below shows the deadlines for the **WP2's deliverables**:

Table 1: list of the deadlines for the trial chairs and use case coordinators, according to the deliverables of WP2

Code Deliverable	Deliverable Name	Deliverable Objectives	Deadline for the Trials
D2.1.1	Trial Implementation Guidelines	Generic guidelines outlining common features and practices for all trials and trial-specific guidelines that include tailored information on for each of the trials and individual use cases.	31/01/2017
D2.1.2	Trial Implementation plan	Detailed plan for implementation of each trial and individual use cases outlining "Who does what, when and how?" to the tiniest detail. The Plan will be developed on Trial and use case level and will include: definition of the exact areas/facilities of deployment, technical requirements, activity calendars, evaluation and dissemination methods, evaluation and dissemination material preparation, tasks and responsibilities of involved parties	31/05/2017
D2.2.1	Installation, Customization and Integration Report	According to pre-defined templates, this ICI Report will be delivered by all use cases, compiled and published as a joint ICI report. It will describe the installation process, customization and integration steps taken, and arisen issues and the way they were solved. Moreover, description and evaluation of training provided to end users will be included.	30/11/2017
D2.3.1	Annual Implementation and Performance Monitoring Report	Each use case will deliver a report after each iteration of technical improvements and testing stating and explaining the current status of development, the successfulness of implementation, and achieved performance of the IoT system/solution. These reports will be published jointly at the end of each year of project implementation.	30/11/2017 30/11/2018 30/11/2019 30/11/2020

D2.3.2	Recommendation For Open Calls	Based on the results of implementation of each use case recommendations for further expansion of trials will be compiled in terms of involvement of new end users and implementation of new IoT solutions	30/04/2018
D2.4.1	Technical Improvements Report	Following the recommendations by TC based on the end-user feedback, IoT providers will improve their respective solutions and file a report after the release of each new version of the product. These reports will be compiled and published two times during the lifetime of the project	31/05/2019 30/11/2020
D2.5.1	Scale-Up Demonstration Report	The Report will describe all implemented demonstration activities envisaged in T2.5, informational/promotional material used, tools used to collect feedback, and present the collected feedback and analysis thereof. The report will be published two times during the course of the project, to capture the distinct phases of the demonstration activities.	31/08/2019 30/11/2020

It must be noticed that the above listed deadlines do not include all the deadlines of the project.

Other work packages might need information or documentation from Trial chairs or use case coordinators. In this case, WP leaders or co-leaders of the respective WPs will directly contact the Trial chairs and/or the use case coordinators when information or documentation is needed.

4. TRIAL-SPECIFIC GUIDELINES THAT INCLUDE TAILORED INFORMATION FOR EACH OF THE TRIALS AND THE INDIVIDUAL USE CASES

4.1 SPECIFIC GUIDELINES FOR TRIAL 1: THE INTERNET OF ARABLE FARMING

<p>Trial 1</p>	<p>Arable Farming Technology Chair: Corné Kempenaar (WUR) Business Chair: Vik Vandecaveye (CNH Industrial) Ecosystem Chair: Peter Paree (ZLTO)</p>	
<p>Specific Goals</p>	<p>Arable farming faces several challenges, amongst which reduction of pesticide, fertilizer and energy use, less adverse side-effects on the environment, safe and transparent agri-food chains, and last but not least, contributing to Greening of the CAP of the EU Through the 4 use cases, this trial faces all the most important challenges</p> <ul style="list-style-type: none"> • improve resource efficiency and to reduce adverse side-effects of nitrogen use and irrigation; • better crop and soil monitoring, reduction of herbicide use and more sustainable water use; • better crop, soil and climate and yield monitoring, and, more sustainable crop protection by less use of pesticides; • more sustainable soil tillage, machine to machine communication for application of task maps and data sharing amongst farmers and within agri-food chains. <p>The IoT challenges addressed in the arable trial are implementations of IoT devices to acquire near real-time site-specific soil, crop, climate and storage data, to link the devices to platforms and clouds, to align the data with agronomic models, databases and data analytics tools, and to align with FMIS and farm machines in order to deliver task maps for precision farming and to generate information for chains optimization.</p>	
<p>Envisaged Outcomes</p>	<p>The most important outcomes for Trial 1 are:</p> <ul style="list-style-type: none"> • the resource efficiency improved through the use of different types of sensors (soil moisture sensors, soil organic matter sensors, climate sensors, yield sensors, etc.), which task is to predict yields, to define management zones, and to make task maps that are sent to farm equipment (e.g. variable rate application of soil herbicides). Moreover the data will be shared within chains to optimize the result; • the precision farming techniques on conventional and organic agriculture fine tuned, solving hindering factors such as: high costs of adoption, optimization of processes, spread knowledge on how to use the technologies and adaptation to different environments; • machine communication optimised for better interoperability and a more efficient use of the technologies 	

<p>Technical chair's Guidelines (Cornè Kampenaar)</p>	<p>The role of the Technical Chair will be to ensure that all four pilots follow the guidelines from WP3, especially in terms of leverage existing IoT technologies, approaches, methodologies and guidelines, and facilitate collaboration and synergies between use cases. It will assist in the smooth integration and testing of the IoT components together with the technology providers associated with each use case. It will also record and report validation and evaluation feedback by the users.</p> <p>More in specific, for the Arable Trial there is the need to enhance a great collaboration between the first three use cases (vertical U.C.s) and the fourth use case (horizontal U.C.). The technologies deployed in the three vertical trials can be implemented in the horizontal use case to show their interoperability in several crops, situations and climates. Such cooperation is needed as well with the other four trials, as the U.C.1.4 can prove machine to machine communication and task management in other than arable fields.</p>
<p>Business chair's Guidelines (Vik Vandecayeve)</p>	<p>For the BC of the Arable Trial, it is important to set, at start, the right baseline for the KPI calculations for the economic impact. This means defining the calculation methods, the data sources and the measurements at start of the project. In an ideal world, the KPI's are self-explanatory or at least easy to understand. The KPI needs to be well documented. The methodology should not change during the course of the project.</p> <p>Second point of importance is to get detailed guidelines from the WP4 leader on the requirements for the calculations to make the business a success.</p> <p>For the presentations, a streamlined visual format would be ideal, hopefully we can use the same for all trials. Templates will enhance the process of collecting input data.</p> <p>As always, in business reporting, pro-activity pays off in the end, as well as good communication.</p> <p>We need to investigate collaboration between the different business chairs across the trials.</p>
<p>Ecosystem chair's Guidelines (Peter Parea)</p>	<p>TRACK PROGRESS IN ECOSYSTEM DEVELOPMENT</p> <ul style="list-style-type: none"> • The use cases are encouraged to track their progress concerning dissemination and demonstration, and their other KPIs at a regular basis • End-users should be given a proper training, and the training needs, delivered trainings and end-user feedback on the technologies should be tracked • Communication of the use cases goals and results to the broader public, to end-users and other stakeholders in the value chain from farm to fork is highly encouraged; and there must be taken advantage of these events to collect feedback to support the technology development • Interesting upcoming events that allow for dissemination of the IoF2020 meat use case will be shared openly among the use cases • The progress in these previous topics will be communicated by the use cases at the monthly trial telco's • Any additional information requested from WP5 will be communicated to the use case coordinators throughout the project, giving them sufficient time to prepare the information by a given deadline <p>ETHICS IN PUBLISHING/DISEMINATING</p>

	<ul style="list-style-type: none"> • When publishing or disseminating results, ethics and (scientific) integrity should be followed at all times! This includes mentioning all the partners that cooperated in the work, listing the correct co-authors, giving partners a sufficient amount of time to review texts, etc. • Agreements on confidential information should be made within the use cases, if applicable, and should be clearly communicated to the use case partners and the trial chairs
<p>Additional Information from U.C. 1.1 “Within-Field Management Zoning”</p>	<p>The use case coordinators have already met their partners in several meetings to set up the demonstrators that will take part within the U.C. 1.1. More precisely, in 2017, we met twice: 24th of January and 15th of February. Finally it was decided to set-up 4 demonstrators:</p> <ul style="list-style-type: none"> • VRA soil herbicides • VRA N-topdress, • VRA haulm killing • VRA Planting density (shade, sprayer tram line, clay content) <p>The 4 demonstrators will be used to reach the U.C.’s goal of demonstrating the use of VRA maps in potato crop management.</p> <p>The use case coordinator will make sure the the envisaged outcomes for each of the 4 demonstrators will be reached, coordinating the partners within the use case and liaising with the trial chairs to extend the economic, environmental and social impact of the use case.</p> <p>The U.C. coordinators will collect the KPI measurements with large advance to ensure the avoidance of delays. As well, as written in the role description, the U.C. coordinators will call the monthly meeting at use case level, providing the agenda to the partners and releasing the minutes of the meeting on the platform.</p>
<p>Additional Information from U.C. 1.2 “Precision Crop Management”</p>	<p>The UC 1.2 is composed of 2 partners with well-defined and complementary activities: Orange for technical aspects on data acquisition, transmission and storage ; ARVALIS is the UC coordinator as well as the trial chair. Therefore, the trial management is eased. The monitoring system is provided by a subcontractor, HIPHEN. The UC coordinator will be in charge of the communication with the subcontractor to solve possible problems. The organization is defined as follow:</p> <ul style="list-style-type: none"> • 1 meeting every month by visio-conference to decide the work plan for the following month and report progress and problems. <p>This is a minimum frequency and during the growing season (from November untill July), more frequent interactions will be necessary and under the responsibility of each partner.</p> <p>2 months before each reports delivery deadline, the UC coordinator will notify his partner the required information to be able to provide the report one month before the deadline.</p>
<p>Additional Information from U.C. 1.3 “Soya Protein Management”</p>	<p>The U.C.1.3 is composed of 2 partners – Donau Soja and Soia Italia – both involved on soybean market support and consolidation.</p> <p>In Donau Soja the contact for planning field trial and data acquisition in Austria is Leopold Rittler.</p> <p>In Soia Italia the contact is Alessandra Bonamano (for data analysis and contact with other partners and units).</p>

	<p>The UC-coordinator is Matteo Bertocco (field activities coordination and development).</p> <p>Field trials will be carried out on 1 conventional and 1 organic farm in Austria and 1 conventional and 1 organic farm in Italy, with the same protocol we are defining according to the field condition and difference of the two areas (farm average surface, climatic conditions, soil types, crop rotation during years, etc.)</p> <p>Field trials will be carried out during 3 seasons with the follow deadline, by applying precision farming instruments and methods:</p> <ul style="list-style-type: none"> • 1st season: analysis of field variability factors (soil and field condition) that could limit soybean protein content, spatially measured at harvest. • 2nd season: analysis of correlation among limiting factor and protein content and planning activities to reduce their influence on reducing protein % • 3rd season: field management of variability to optimize soybean yield, in terms of ton/ha and protein %, by using variable rate management of different input (seed density to control weed; localized weed control; localized nutrient input; water supply). <p>External services will be considered for the analysis and the monitoring of field variability: at now is a working progress phase.</p> <p>An internal meeting (Doanu Soja and Soia Italia) is planning every 15 days to verify the field condition and field progress in Austrian and Italian farms during the growing season (April-September). The UC-coordinator will periodically notify the work status to other partners with the aim to obtain data and results which could be helpful for farmers and members of the two associations. Field results will be disseminated by using articles and videos, and also the events organized by the associations.</p>
<p>Additional Information from U.C. 1.4 “Farm Machine Interoperability”</p>	<p>The U.C. 1.4 is the horizontal demonstrator of the first trial. Which means that it is not focus on only one crop, but on technologies that can operate in different environments and for different crops.</p> <p>Because of this horizontal approach it is very important the Internal collaboration and coordination with the “vertical” use cases (U.C.1.1, U.C.1.2 and U.C.1.3).</p> <p>The main objectives of this collaboration are:</p> <ul style="list-style-type: none"> • to get high quality and specific input for the definition of the requirements • to design and try out solutions for different data exchange technologies <p>We also need to liaise externally with the SDO’s (standard development organisations) and AIOTI WG03 (Standardisation)</p> <ul style="list-style-type: none"> • To identify existing standards which could be used or modified • To make our requirements heard and report gaps in the standards • To propose solutions used in the trial for potential adoption <p>A point to take care of is the confidentiality as defined in the Consortium Agreement section 10. We need a clear understanding between the participating partners when talking to external parties like SDOs and other companies working on standards. Clear guidelines for this understanding might be formalised by the help of Technology Transfer Officers from the Universities.</p>

4.2 SPECIFIC GUIDELINES FOR TRIAL 2: THE INTERNET OF DAIRY FARMING

<p>Trial 2</p>	<p>Dairy Farming Technology Chair: Ivan Andanovic (Uni of Strathclyde) Business Chair: Patrick Honcoop (365farmnet) Ecosystem Chair: Kees Lokhorst (WUR)</p>	
<p>Specific Goals</p>	<p>The main goals of the dairy trial are:</p> <ul style="list-style-type: none"> • Implement, experience and demonstrate in some EU-countries the use of real-time sensor data from ‘grass to glass’ to create value in the dairy chain by applying the FAIR (Findable, Accessible, Interoperable, Reliable) principle. It will benefit health, welfare, environment and resource efficiency. • Reduce the environmental impact of dairy farming • Show case the benefits of using individual cow sensors • Improve animal health and extend animal life by early disease detection • Optimize cow fertility, by early heat detection • Improve farm profitability by enhancing animal welfare and cow productivity • Increase transparency along the dairy supply by sharing information regarding milk quality and farm processes 	
<p>Envisaged Outcomes</p>	<p>The expected outcomes for the dairy trial are:</p> <ul style="list-style-type: none"> • Use of trackers and tags that will enable the unique identification of the animals (objects), their location and their activity (motion) • Integration of multiple sensors into a disease detection and decision support platform • Substantial improvement of animal welfare and productivity on trial farms • Lower environmental impact through improved processing efficiency, thus improved resource use • Improved quality of the final product (milk), thanks to healthier animals and a perfect feed combination 	
<p>Technical chair’s Guidelines (Ivan Andanovic)</p>	<p>As technical chair of Trial 2, there are several trial challenges that need to be addressed to maximise the environmental impact of the project:</p> <ul style="list-style-type: none"> • Detailed surveys of all test sites to be carried out before any deployments. Validation of operation of trial systems is important during installation including ensuring that appropriate data is being gathered. • Data gathering infrastructure: ability to deploy the range of wireless standards across the trial. Legacy systems must be utilised at every opportunity. • Data Format and Storage: enable data transfer and exchange between the trial sites. Agreement should be reached from the outset on the development of interfaces for effective data exchange and sharing. <p>The trial must accommodate technology elements from different hardware and software vendors. Edge computing should be employed whenever</p>	

	<p>appropriate so as to reduce the volume of data that requires to be transported and optimise the use of limited energy sources. Measurement data from the spectrum of sensors – and indeed from other key data sources - must be compatible having the necessary API to ultimately communicate to the multiple trial platforms (cloud). Validation of the outputs of the trial systems must be central for the determination of the economic impact from on-farm through the supply chain. In this respect truthing data must be gathered in tandem with system data from the outset.</p>
<p>Business chair's Guidelines (Patrick Honcoop)</p>	<p>Within the dairy trial a monthly telco is held, and progress regarding the product development and test planning is discussed. Together with the WP4 team, an early discussion will take place with each use case to elaborate how to assist on business modelling and KPI testing. If needed they will be assisted by finding test farms across Europe. After Business model definition, it will be discussed which sales channels could be used, for instance existing platforms or a stand-alone solution. KPI measuring will start in an early phase. Results will be used to evaluate product improvements. The business chair also gives support for:</p> <ul style="list-style-type: none"> • Early testing of a MVP of each use case on test farms, best case already in 2017 • Involve other stakeholders across the supply chain, mainly relevant for UC1.1 and UC1.4 • Support business modelling and price setting based on added value for end customer • Define sales channels for different products <p>This will lead to the following outcomes:</p> <ul style="list-style-type: none"> • Early market feedback which will be used for product improvement (iterative process) • Engaged stakeholders like dairy companies and/ or retailers which support the product development and could support product selling or using the product themselves. A dairy company could advice his farmers the UC1.1 product to report outdoor grazing • Overview with products and prices, based on experiences on test farms and discussions with end users <p>For each UC an overview with potential sales channels and ranked on attractiveness</p>
<p>Ecosystem chair's Guidelines (Kees Lokhorst)</p>	<p>The role of the Ecosystem Chair is focused on:</p> <ul style="list-style-type: none"> • Collecting and reporting to the WP2 leader (BioSense) and co-leader (ILVO) the KPI's measuring the impact (social, etc.), dissemination, demonstration and feedback from the separate use cases and the impact of the joint effort as dairy trial. Start point is the description established in the Final Proposal of the IoF2020 project; In other words the Ecosystem Chair will stimulate partners to work on their impact and he will do the (independent) monitoring and evaluation. • The Ecosystem chair will actively participate in the strategic decisions of the dairy trial with the Technical chair and the Business Chair, they make specific appointments to organise their meetings. This group will also identify the needs for adjustments that can be implemented in the additional call in 2018. New partners (ecosystem) can be added in that period. Participating at all the trial-

	<p>package meetings (1 meeting a month (TELCO)), WP meetings (1 every quarter (TELCO)) and consortium meetings</p> <ul style="list-style-type: none"> • Will be the bridge between the Dairy Trial and the WP5 (Ecosystem Development) providing the information to secure that the envisaged objectives established in the final proposal of the IoF2020 project, are reached and will secure that use cases are provided with the proper support from WP5. <p>The Ecosystem Chair will actively communicate the results of the dairy trial and underlying use cases to the broader public and collect end-user and stakeholder feedback to support the technology development.</p>
<p>Additional Information from U.C. 2.1 “Grazing Cow Monitor”</p>	<p>For UC2.1 the following guidelines ensure a smooth cooperation between partners:</p> <p>DELIVERABLES:</p> <ul style="list-style-type: none"> • The UC coordinator will inform and request the necessary information from the UC partners for deliverables & reports as soon as the request comes from WP2 • The UC partners deliver quality information and reports on-time by the deadline given by the UC coordinator (ideally min 2 weeks before the WP deadline), giving the UC coordinator time to merge the documents and create a concise report • If the UC coordinator makes substantial changes in the UC partner’s input or the partner asks for a review, they will send the text back to the partner for review of limited time (ideally of max 2 days) before sending it to WP2 on-time <p>COOPERATION:</p> <ul style="list-style-type: none"> • UC coordinator will gather information from the UC partners on a monthly basis to report to the trial chairs and WP2, such as KPI monitoring, dissemination progress, technical progress, etc. • In case extra information is needed for the WPs or the trial chairs, maximum effort of all partners will be done to ensure that the information is delivered on-time • Also the possibilities of cooperation with the other WPs and other use cases will be kept open and will be actively pursued if mutual benefits are present • Open communication is very much encouraged
<p>Additional Information from U.C. 2.2 “Happy Cow”</p>	<p>The use case coordinator will assure that the tasks described in the role description.</p> <p>Other points of interest will be addressed by the U.C. coordinator:</p> <ul style="list-style-type: none"> • Minimum of three weeks of lead time for the documentation for the deliverables will be ensured • Appropriate personnel will be assigned for compiling the meeting agenda, which will be circulated through the use case partners prior weeks before the meeting • There is the need to that the selected farms for the trials should not have overlapping technologies. This will be co-ordinated among the stakeholders.

	<p>Moreover, the use case coordinator will function as the reference point for the partners of the use case, coordinating their work and ensuring that KPIs are measured on time and with the right methodology.</p> <p>As well , the U.C. coordinator will closely follow-up the development of the three IoT technologies present in this use case:</p> <ul style="list-style-type: none"> • Sensor Device: An accelerometer based custom designed sensor that measures the raw activity of a dairy cow in 3D space. This data is streamed over radio frequency to the base station device in real-time, continuously. • Base Station Device: The base station device receives the raw accelerometer signal and processes this signal in real time to determine what behavior the animal is performing at any given time. The base station uses an advanced artificial technology to determine the behavior of the cow and has the ability to learn new behaviors. • Cloud Platform: The cloud platform aggregates all basic behavior information for every cow from every farm and processes the information to generate insights based on reasoning models and machine learning at cloud scale. The cloud platform also enables integration of third party data sources such as those of feeding, breeding and value chain organizations to generate upstream and downstream analytics.
<p>Additional Information from U.C. 2.3 “Silent Herdsman”</p>	<p>Several commercial farm sites across the UK have already been identified in order to undertake the evaluation and showcase the system. The key Milestone is the demonstration of a validated decision support service, integrating all the measures obtained in a scalable and flexible platform following identifiable IoT principles. One of the core values of the IoF project is the ability to integrate the outputs of the Use Cases under dairy which allows for benchmarking exercises to be carried out. Thus, close working relationships between Use Case Coordinators is compulsory and common data formats to enable high level comparisons of farming practices must be agreed. Furthermore, duplication of the scopes of trials should be avoided.</p>
<p>Additional Information from U.C. 2.4 “Remote Milk Quality”</p>	<p>The UC 2.4 “Remote Milk Quality” is open for support of and cooperation with the other use cases. In particular when quality assurance can support or empower optimal demonstration of the use case.</p> <p>In order to ensure a successful use case coordination, I will perform the following activities in collaboration with the use case partners:</p> <ul style="list-style-type: none"> • Planning: collect the use case requirements and specifications, define activities, estimate resources activities and duration, develop schedule. • Executing: direct and manage use case execution, distribute information (progress reports, deliverables, dissemination etc.). • Monitoring and controlling: monitor and control use case work, verify and control use case scope, control schedule and costs, reports performances and KPIs, monitor and control risks. • Closing: Final report and exploitation plan <p>Monitor promotion and dissemination of the developments and results obtained in this use case.</p>

4.3 SPECIFIC GUIDELINES FOR TRIAL 3: THE INTERNET OF FRUIT

<p>Trial 3</p>	<p>Fruit Sector Technology Chair: Spyros Fountas (AUA) Business Chair: Jose Louis Molina Zamora (HISPATECH) Ecosystem Chair: Vincenzo Verrastro (CIHEAM)</p>	
<p>Specific Goals</p>	<p>The main specific goals in the fruit trial, considering the different use cases are:</p> <ul style="list-style-type: none"> • Field near-real time remote control of cultural operations and orchard status for the different fruit crops, considering water, fertilization, pests, diseases, fruit quality, soil or air conditions. • Remote operation and/or full automation of certain field operations (mainly irrigation and fertilization). • Transformation and quality control processes real time control and automation. • Near-real time control of logistic operations to distribute fruits or its transformation products, such as wine or olive oil. • Better operational decisions, both in the field and in transformation / storage / commercialization processes, based on advanced analysis of stored data. 	
<p>Envisaged Outcomes</p>	<p>The specific outcomes of this trial should be mainly focused on effective and fast adoption on IoT technologies in a big scale. In order to achieve it, some key factors:</p> <ul style="list-style-type: none"> • Tangible and easy-to-demonstrate benefits for farmers and agri-business. Success stories. • Adaptable to the most frequent products, climate conditions, transformation processes or farms. • Cost effective solutions, and financial tools to make them more accessible. • Easy adoption and usable solutions for sector agents. • Modularity and openness. • Robustness. • Reliable support in the market, close to the users. 	
<p>Technical chair's Guidelines (Spyros Fountas)</p>	<p>The role of the Technical Chair will be to ensure that all four pilots follow the guidelines from WP3, especially in terms of leverage existing IoT technologies, approaches, methodologies and guidelines, and facilitate collaboration and synergies between use cases. It will assist in the smooth integration and testing of the IoT components together with the technology providers associated with each use case. It will also record and report validation and evaluation feedback by the users. The technical issues on the Fruit Trial are as follows:</p> <ul style="list-style-type: none"> • Field level technical issue: (i) antenna transmission problems due to tree and vine canopy; (ii) enable automated actuation for specific operations (i.e. irrigation) • Processing technical issue: enable data transfer & exchange between the field and the processing plants (winery, olive oil mill, table packaging, bottling) 	

	<ul style="list-style-type: none"> • Fruit trade issues: data transfer and exchange between the field/processing to RFID tags • Software challenges: Develop interfaces for all supply chain sectors taking into consideration the technical skills each sector members possess (i.e. simplified interfaces for farmers) <p>Hardware issues: (i) different hardware vendors for each country and each supply chain level; (ii) Sensors should be compatible and having the necessary API to communicate to each other and to the IoT platform (cloud); (iii) Validation of IoT components is very important during installation and operation; (iv) sensors should have self-aware capabilities to be robust throughout the growing season.</p>
<p>Business chair's Guidelines (Jose Louis Molina Zamora)</p>	<p>In order to succeed in this IoT trial, there are some key points to consider in the first project phase:</p> <ul style="list-style-type: none"> • Fast start of the project since the first season, in such a way the learning-refining process starts in the earliest possible moment. • Barriers detection for IoT solutions implementation, both passive or active, in whatever level of the project. • Full user involvement with project goals, and possibility to change business users in early stages if they are passive or non-fully involved. • Focus on achieving business improvements, even if we had to partially change resources or technologies to use. • Define, share and follow up of KPIs to measure business impact since the beginning. <p>Besides the short term tasks, the BC of the Fruit Trial will cooperate with WP4, and assure that their inputs are implemented at use case level, to enhance the economic impact of the trial. As well, the BC will be in close contact with the use case coordinators of the four U.C.s within the fruit trial, to assist and help them on the KPIs evaluation for the economic impact.</p>
<p>Ecosystem chair's Guidelines (Vincenzo Verrastro)</p>	<p>For the ecosystem chair, it is of great importance the respect of international norms (at EU level) for the "certified agriculture":</p> <ul style="list-style-type: none"> • According to the EU norm I would like to maintain the focus of the fruit trial on the "certified agriculture", in which the respect of international norms are fundamental for the final consumer. • Furthermore the EU Directive 128/2009 speaks about the sustainable use of pesticides in which every Member State must prepare a National Action Plan (NAP) for his implementation. • At the moment we have different implementation according to the decisions of every Member State and for this reason the implementation of IoT technologies should be guaranteed by the certifications schemes (voluntary or compulsory). • KPI's technologies should be also explained in terms of food safety and health insurance of the final consumer through an on-line participation of selected stakeholder. <p>Moreover there is the need to track progress in the ecosystem development</p> <ul style="list-style-type: none"> • The use cases are encouraged to track their progress concerning dissemination and demonstration, and their other KPIs at a regular basis

	<ul style="list-style-type: none"> • End-users should be given a proper training, and the training needs, delivered trainings and end-user feedback on the technologies should be tracked • Communication of the use cases goals and results to the broader public, to end-users and other stakeholders in the value chain from farm to fork is highly encouraged; and there must be taken advantage of these events to collect feedback to support the technology development • Interesting upcoming events that allow for dissemination of the IoF2020 meat use case will be shared openly among the use cases • The progress in these previous topics will be communicated by the use cases at the monthly trial telco's • Any additional information requested from WP5 will be communicated to the use case coordinators throughout the project, giving them sufficient time to prepare the information by a given deadline
<p>Additional Information from U.C. 3.1 "Fresh Table Grapes Chain"</p>	<p>According to the structure of the use case, the fresh table team did already several on-line skype meeting. Everybody was informed that the use case is composed from an Italian part (CIHEAM-IAMB, APOFRUIT, SYS-MAN) working as a unique team and a mirror team supervised in Greece by Spyros Fountas. The different chain actors have been involved explaining their different roles and duties (in technical and reporting terms) and will be active part in preparing their documents and/or working schemes for the project activities (on-line consultation, KOM, etc.).</p> <p>I will assure the periodical meeting with the scheduled time and inform the WP leader about the KPIs technologies used (or to be implemented).</p> <p>As use case coordinator, I have been called to reply to the different requests coming from the WP responsible and I am active on it.</p>
<p>Additional Information from U.C. 3.2 "Big Wine Optimization"</p>	<p>In order to ensure a successful use case coordination, I will perform the following activities in collaboration with the use case partners for both traditional wine system production in France (DDD,P2W, IMS, CEA, ST) and organic wine system production in Italy (Vineda, ISVEA):</p> <ul style="list-style-type: none"> • Planning: collect the use case requirements and specifications, define activities, estimate resources activities and duration, develop schedule. • Executing: direct and manage use case execution, distribute information (progress reports, deliverables, dissemination etc.). • Monitoring and controlling: monitor and control use case work, when needed perform integrated change control, verify and control use case scope, control schedule and costs, reports performances and KPIs, monitor and control risks. • Closing: Final report and exploitation plan. <p>In top of the management activities and according to my technical background, I will play the role of use case IoT system architect in order to contribute in the definition, development, and deployment of the IoT system that will be deployed in the BIG WINE OPTIMIZATION use case.</p> <p>Furthermore, an important point in the use case management and its success will be the identification of the missing know-how and associated resources in the use case. For instance, data analysis is required in order to have an IoT system enabling the exploitation of all the collected data to facilitate Wine</p>

	<p>producer decision-making. Internal to IoF2020 project or external collaboration will be investigated and established as much as possible. Finally, I will also participate actively in the promotion and dissemination of the developments and results obtained in this use case.</p>
<p>Additional Information from U.C. 3.3 “Automated Olive Chain”</p>	<p>According to the structure of the use case, the Automated Olive Chain team has already done and will do several meetings in order to define the IoT structure to deploy. The tasks to do are:</p> <ul style="list-style-type: none"> • Replying the different requests (documents and information) from the WP leader. • Meeting with the primary and secondary pilot team in order to define the duties and the roles of each partner. • Defining a meetings plan with the use case partners in order to manage and coordinate the actions to do. • Delivering the reports on time and make the required deliverables, also on time, in order to facilitate the coordination of the WP leader. • Identifying the pilot sites in primary and secondary areas. • Identifying the elements that already exists in the identified pilot sites (SCADA in fertirrigation system, onboard devices in tractors and other agricultural machines, sensors, probes, etc.). • Identifying the corresponding KPI that we must manage in each pilot site (both in primary and secondary area). • Defining a deployment plan of IoT devices and the corresponding integration actions with the software platform (both in primary and secondary area). <p>System deployment per each pilot site (both in primary and secondary area) according to the deployment plan</p>
<p>Additional Information from U.C. 3.4 “Intelligent Fruit Logistic”</p>	<p>The Intelligent Fruit Logistics Case Team is jointly working on the use case always in close collaboration and sharing the work between experts in the team. While ATB, Mieloo & Alexander and NXP are developing the system and experimentation platform, GS1 and EPS are responsible for the standardisation and the business application part. EPS is the business owner and will take the role of use case coordinator.</p> <p>In order to keep the meeting workload as little as possible, communication within the use case will be based on scheduled meetings for harmonisation and clarification, but also on bilateral calls to clarify topics and solve issues in between.</p> <p>During the development, a clear functional description and global issue list will help to ensure the timely provision of the system as well as solving issues before and during experimentation.</p> <p>At every time in the project it must be clear who is responsible for which task and action. A central action list will help keeping the overview on the fulfilment of tasks and ensure clear responsibilities.</p>

4.4 SPECIFIC GUIDELINES FOR TRIAL 4: THE INTERNET OF VEGETABLES

<p>Trial 4</p>	<p>Vegetable Sector Technology Chair: Manuel Berenguel (UAL) Business Chair: Erik Pekkeriet (WUR) Ecosystem Chair: Cristina Micheloni (Valoritalia)</p>	
<p>Specific Goals</p>	<p>The main goals of the vegetable trial are:</p> <ul style="list-style-type: none"> • Provide technical IoT solutions close and up to practical implementation that can meet profitable business cases throughout the value chain • Increase of crop productivity and quality by optimal sustainable use of resources (energy, labour, nutrients, water, light, space, chemicals) • Make clear how IoT solutions at farmer level up to the consumer contributes to facilitate society with information, investment development, policy-making, science and innovation across the supply chain. • Improve compliance with legislation and make it more user-friendly and reduce fraud potentials 	
<p>Envisaged Outcomes</p>	<p>The most important outcomes for the vegetable trial are:</p> <ul style="list-style-type: none"> • Enabling the production of high quality vegetables in a very predictable and reliable manner, unaffected by disease and independent of seasonal influences • The development of an IoT DSS system for the integration of an IoT approach in the greenhouse tomato value chain from farm to cooperatives • Camera information from weeding machines available for farmers and other stakeholders to improve profit, quality, yield and efficient use of nutrients, water and soil quality • Simplify and at the same time strengthen the certification systems 	
<p>Technical chair's Guidelines (Manuel Berenguel)</p>	<p>The IoF2020 project in the vegetables trial is defined by specific KPIs and the incorporation of determined technologies managing, facilitating and synthesizing feedback from end-users and stakeholders acceptability along the value-chain. In this situation, the technical coordination implicates the development of a reference architecture which will enable the reuse of IoT system designs and/or data across the use case systems and ensure its interoperability, taking into account recommendations provided by WP3 leaders (IoT Integration and Capabilities). In this platform, key issues demanded by users will be translated into improvement, inserting or removing of technical features. Moreover, it will result in a common understanding, facilitating consistency in the establishment and measurement of KPIs. These KPIs have been updated based on a common pooling where each use case leader established them in order to fit the main Trial and UC objectives.</p>	

<p>Business chair's Guidelines (Erik Pekkeriet)</p>	<p>A Business Chair member supports the UCs within the Vegetable Trial to make the IoTs used into successful and ready to be launched IoT products and chain solutions. Therefore, it is important for the business chair to liaise WP4 and guide UC's through the IoF2020 project support.</p> <p>The Business Chair of this Trial should be able to guide UC-members to the right persons within the project when it comes to business support.</p> <p>The Business Chair will give priority to have success and business opportunities within the UCs and will make Us responsible to focus on sustainable implementation of the IoT outcome after this project. A Business Chair expects this focus also from the different UCs.</p> <p>The Business chair understands its responsibility to gather information, and monitor KPI's that are important to achieve a good IoF2020 project outcome. The business chair will setup additional Telco's to discuss economical progress of the UC's.</p>
<p>Ecosystem chair's Guidelines (Cristina Micheloni)</p>	<p>As Ecosystem chair there are three main aspects that needs to be addressed:</p> <ul style="list-style-type: none"> • Assure that the environmental parameters are monitored by the UCs on time and with fixed time intervals • Assure the the results of the environmental impacts are harmonize, to obtain comparable results • in case of qualitative assessment, there is the need to prepare a precise methodology before the use cases start <p>Moreover regarding ethics in publishing/disseminating</p> <ul style="list-style-type: none"> • When publishing or disseminating results, ethics and (scientific) integrity should be followed all the times! This includes mentioning all the partners that cooperated in the work, listing the correct co-authors, giving partners a sufficient amount of time to review texts, etc. • Agreements on confidential information should be made within the use cases, if applicable, and should be clearly communicated to the use case partners and the trial chairs
<p>Additional Information from U.C. 4.1 "City Farming Leafy Vegetables"</p>	<p>The U.C.4.1 aims to the production of fresh green leafy vegetables (lattice) in controlled environment, without the use of any pesticide and with no need of washing the product before their use. As well the production will be very efficient in term of water use, requiring only half liter of water for 1 kg of final product.</p> <p>The U.C. coordinator will assure that the goals of the use case will be reached, coordinating the two partners: Philips Lighting and Stay Food Group. The first partner will provide the technologies, while the second one will be the end user, selling the lattuces as well to German supermarkets. To ensure the development and follow up of the use case activities, monthly meeting will be set-up at use case level by the U.C. coordinators.</p> <p>Both partners involved in this use case aim to a fast development of the technologies (reducing the cost of production) to have a competitive final product for the market.</p> <p>Another task of the U.C. coordinator will be to coordinate the hardware components (lighting, climate control, irrigation system and logistics) and software components (sensors and control data system) within the use case.</p>

<p>Additional Information from U.C. 4.2 “Chain-Integrated Greenhouse Production”</p>	<p>The aim of this UC is the development of a data sharing platform as an essential tool in seeking solutions through the introduction of technology in each of the phases of the supply/value chain, creating relationships among the different steps based on transparency, product, and process information. The IoT platform (to be developed in FIWARE) integrates information from three main agents: greenhouse crop production, the handling industry, and transport. In this ecosystem situation, the University of Almería (UAL), as ‘Tech provider’, develops a ‘fog computing’ based control system (a “fog”, understood as a “cloud” close to the ground) is presented as a solution to improve system efficiency by reducing the amount of data transported to the cloud for processing, analysis and storage, focusing on water, fertilizer, and energy use efficiency, production planning, safety, transparency and quality standards. COEXPHAL, in the role of trial and implementation manager, provides information from the farm to the cooperative for the development of IoT platforms, allowing interaction with vegetables products as they go outside the farm and/or handling and packaging plants and to the customer through various methods of transport. Finally, ValorItalia, focusing on benefits and improvements in safety and quality regulations, management systems, traceability and certification processes as an important component of global food safety, will improve data standardization amongst the different actors and activities along the supply and value chain, particularly small scale, PDO and organic farmers. Moreover, the UC coordinator will collect the KPI’s from the partners in due date and send them to the corresponding Trial Chairs (Technical, Business and Ecosystem) and coordinate the assigned reports. Although there is a fluent communication between use case partners, the UC coordinator will ensure the correct development of that. Use case meetings will be scheduled and communicated on time to the partners.</p>
<p>Additional Information from U.C. 4.3 “Added Value Weeding Data”</p>	<p>The use case Coordinator will take up the responsibility to execute the UC 4.3 “Added Value Weeding Data” All partners within the use case are committed to contribute to the KPIs that are necessary to accomplish the overall goals of the loFF Program.</p> <p>UC 4.3. uses field data from machinery that is connected to GPS and needs to be stored in a management system on the farm. Therefore UC4.3 needs to exchange and cooperate with other use cases that are using similar approaches. Coordination and exchange is needed with UC 1.1; 1.2; 1.3;1.4; 2.1 and 3.1. UC leader needs leadership on this form WP2 management to setup an exchange meeting within the first four months.</p> <p>UC 4.3 could use assistance in standardized software platforms which are investigated in WP3. Also the hub to exchange software is of great interest of UC 4.3 and UC 4.3 will also contribute to this platform.</p> <p>UC 4.3 is planning to have the system in <u>full operation within the first year</u>. Therefore it is very important that WP3 has its platforms, hubs and support operational within the first 5 months. This is key for the success.</p> <p>UC 4.3 has the ambition to bring research and development close to market introduction products. Partners within the consortium should be able to make profit out of this project and start the final developments and</p>

	<p>introduction after the IoF20200 Project period. Business support form WP4 is helpful, but it should provide help to our partners in a direct way. Trial leaders (team) are close to the project execution and have a responsibility to connect between UC's and WP achievements.</p>
<p>Additional Information from U.C. 4.4 "Enhanced Quality Certification System"</p>	<p>UC 4.4 aims to improve product and process certification system increasing traceability, proof of origin, proof of production method and simplified certification patterns using real farm cases. The current certification system will be improved introducing process automatization, bottle tracking and on-line audit for the PDO and the organic certification. Valoritalia will manage and coordinate the implementation of the farm cases (PDO and organic) and will coordinate the activities and operations within the assigned use case, being sure to avoid delays. Any delay and problem will be reported to trial 4 coordinators.</p> <p>During the software development, UC4.4 coordinator will coordinate the new data and new procedure implementation. Monthly meetings (on-site or on-line) will monitoring progress and delays. Valoritalia auditors will be trained to the new software. Before the final release, this new software will be tested and stressed in the field conditions for increasing its robustness. UC4.4 coordinator will collect the KPI's from the partners within the assigned use case, avoiding delays and/or missing information.</p>

4.5 SPECIFIC GUIDELINES FOR TRIAL 5: THE INTERNET OF MEAT

<p>Trial 5</p>	<p>Meat Sector Technology Chair: Mikel Larrañaga (IK4) Business Chair: Kristof Mertens (Porphyrio) Ecosystem Chair: Jarissa Maselyne (ILVO)</p>	
<p>Specific Goals</p>	<p>The Meat trial aims to implement, experiment and disseminate the use of IoT technologies to improve meat value chain through new knowledge-based livestock production systems: addressing animal production, health and welfare requirements, traceability aspects and producing internationally competitive meat products improving both meat industry profit and animals health and welfare.</p> <p>More in specific:</p> <ul style="list-style-type: none"> • Optimise pig production management via on-farm sensors and slaughterhouse data, enable a revolution in the management of pig farms via optimal use of data throughout the chain. • A more efficient poultry production through poultry meat production chain monitoring, defining the production efficiency and product quality of the poultry meat, starting from the broiler farm to the processing plant. • Focusing on transparency of data directly or indirectly related to the quality of products, aiming to enable to share information along the whole supply chain in both directions, from farm to retailers even consumers. and from consumer/retailers to farms, through all the stakeholders. 	
<p>Envisaged Outcomes</p>	<p>The most important outcomes for the meat trial are:</p> <ul style="list-style-type: none"> • Through the considered approach and technologies, the farm sub-systems, sensors, actuators and the animals can be turned into virtual IoT entities, hiding the low level technology complexities and enabling the envisioned revolution in the management of farms via optimal use of data throughout the chain. Smart objects e.g., based on RFID technology, specific sensors to measure/monitor drinking water consumed, presence, animal behavior or environmental condition e.g., temperature, CO2 level, humidity, ammonia could thus be used to digitally enrich the information associated to the virtual animal. • The collected data and processed information can be used to feed innovative early warning and decision support systems as well as to support advanced food traceability and security solutions. • Feed intake, water intake and climate conditions parameters will be precisely measured through Wireless Sensor Networks and complemented with external data coming from different sources like open data (weather data), supplying real time information at chicken level and the environment to provide personalized ventilation strategy for each growing facility. • Based on all events containing monitored temperatures a discrete event model for food quality decay will simply calculate the actual meat quality at that point in time. The combination of the duration of the event (i.e. the time since the previous event with a monitored 	

	<p>temperature and the present event, e.g. 6 hours in a refrigerator truck), the temperature (4°C) and the previous quality allows calculating the decrease in quality and thus the new current quality.</p>
<p>Technical chair's Guidelines (Mikel Larrañaga)</p>	<p>Special effort on coordinating and delivering mainly the updates on technical progresses of the horizontal UC 5.3 (Meat transparency and traceability use case) to UC 5.1 and UC5.2, in terms of interoperability of the shared data among the whole chain in both directions will be done by the Technical Chair.</p> <p>Other potential technical progresses of some of the three use cases of the Meat Trial that could benefit one of the other use cases will be also considered to put on knowledge by the Technical chair.</p> <p>Additionally, special effort will be made in fostering interoperability of IoF reference architecture supported by WP3, including the use of already identified platform modules wherever possible (e.g. FIWARE)</p>
<p>Business chair's Guidelines (Kristof Mertens)</p>	<p>As Business chair of the Trial 5, besides the tasks within the role description, a list of to do things for the first 6 month was made, to assure the best economic impact of the trial:</p> <ul style="list-style-type: none"> • Within the first 6 months of the project – provide description of data collection / calculation to define the KPI's and procedures used to monitor these KPI's • This calculation has to be supported by information from stakeholders in the chain – what do they define as the baseline-reference and the objectives (especially for the transparency case, add qualitative info) • Within the first 6 months of the project – define the baselines for each use case • 6-monthly: Quantitative progress report on obtained KPI results, with possibility to fine tune previously obtained results. <p>Moreover, the BC will focus on assuring that the technologies developed and/or used in each use case will be market driven, in order to be accepted by the market once ready. For this specific purpose, the cooperation with the WP4 will be of great importance, to strenghten the economic impact of the overall project.</p>
<p>Ecosystem chair's Guidelines (Jarissa Maselyne)</p>	<p>TRACK PROGRESS IN ECOSYSTEM DEVELOPMENT</p> <ul style="list-style-type: none"> • The use cases are encouraged to track their progress concerning dissemination and demonstration, and their other KPIs at a regular basis • End-users should be given a proper training, and the training needs, delivered trainings and end-user feedback on the technologies should be tracked • Communication of the use cases goals and results to the broader public, to end-users and other stakeholders in the value chain from farm to fork is highly encouraged; and there must be taken advantage of these events to collect feedback to support the technology development • Interesting upcoming events that allow for dissemination of the IoF2020 meat use case will be shared openly among the use cases

	<ul style="list-style-type: none"> • The progress in these previous topics will be communicated by the use cases at the monthly trial telco's • Any additional information requested from WP5 will be communicated to the use case coordinators throughout the project, giving them sufficient time to prepare the information by a given deadline <p>ETHICS IN PUBLISHING/DISSEMINATING</p> <ul style="list-style-type: none"> • When publishing or disseminating results, ethics and (scientific) integrity should be followed at all times! This includes mentioning all the partners that cooperated in the work, listing the correct co-authors, giving partners a sufficient amount of time to review texts, etc. • Agreements on confidential information should be made within the use cases, if applicable, and should be clearly communicated to the use case partners and the trial chairs
<p>Additional Information from U.C. 5.1 "Pig Farm Management"</p>	<p>For UC5.1 the following guidelines ensure a smooth cooperation between partners:</p> <p>DELIVERABLES:</p> <ul style="list-style-type: none"> • The UC coordinator will inform and request the necessary information from the UC partners for deliverables & reports as soon as the request comes from WP2 • The UC partners deliver quality information and reports on-time by the deadline given by the UC coordinator (ideally min 2 weeks before the WP deadline), giving the UC coordinator time to merge the documents and create a concise report • If the UC coordinator makes substantial changes in the UC partner's input or the partner asks for a review, they will send the text back to the partner for review of limited time (ideally of max 2 days) before sending it to WP2 on-time <p>COOPERATION:</p> <ul style="list-style-type: none"> • Collaboration with the horizontal use case 5.3 is important and concrete arrangements with UC 5.3 will be made on this topic • UC coordinator will gather information from the UC partners on a monthly basis to report to the trial chairs and WP2, such as KPI monitoring, dissemination progress, technical progress, etc. • In case extra information is needed for the WPs or the trial chairs, maximum effort of all partners will be done to ensure that the information is delivered on-time • Also the possibilities of cooperation with the other WPs and other use cases will be kept open and will be pursued if mutual benefits are present <p>Open communication is very much encouraged</p>
<p>Additional Information from U.C. 5.2 "Poultry Chain Management"</p>	<p>The coordinator of the use case 5.2 will act also as Technical Chair of Meat. This will ensure a close relationship between the Use Case Coordinator and the Meat Trial Chairs, smoothing the transfer of information to accomplish the use case objectives following the Meat Trial guidelines.</p> <p>Although the main requirements of the pilot were defined in detail at proposal stage, those might change during the implementation. The use case coordinator will be in charge of assuring the requirements fulfil the</p>

	<p>objectives of the use case by the organizations of TELCOs with all the use case partners and visits to the pilot installations from the very beginning of the project.</p> <p>In the same terms, the use case coordinator will be in charge of monitoring and actualizing the KPIs defined at proposal stage, and to add more in case new are required, to send appropriate ones to the trial chairs.</p> <p>Besides, physical tests for the deployment of sensors are scheduled in the first 4 months of the project in real world, as the aggressive environment that the devices will be faced with on the facilities (dust, chemical products and water during the cleaning) might lead to malfunctions. Several desings of envelops are scheduled during the learning process of the deployment.</p> <p>Moreover, the use case coordinator will be in charge of gathering the necessary inputs from the use case partners in a monthly basis, in order to assure the proper delivery of information to the other WPs for the implementation of the planned activities and the writing of the deliverables. The information received from the partners will be first reviewed before sending to the other WP and trial leaders by the use case coordinator, and in case this not fulfil the necessary standards of quality, will be requested again to the use case partners.</p>
<p>Additional Information from U.C. 5.3 “Meat Transparency and traceability”</p>	<p>The team has experience in collaborating effectively and efficiently, as they were already a team in previous experiences.</p> <p>One of the extra challenges for this use case is the fact that no end-users (especially pig farmers) are part of this use case team. Good collaboration with UC 5.1 (Pig Farm Management) is essential. Good mutual understanding between UC 5.3 and the Dutch farmer organization ZLTO will lower the risks related to this challenge.</p> <p>UC 5.3 aims at providing a data infrastructure for other use cases. It is – in this sense – a horizontal use case This data infrastructure is completely based on existing standards (EPCIS, (S/L)GTIN, GLN, CBV and more), enables (1) to capture, store and reuse event based data, (2) has a growing number of applications in food supply chains (beef, fish, fruits & vegetables) and (3) is extremely easy to scale.</p>

5. CONCLUSIONS

The overall guidelines and information provided throughout the deliverable represent the concrete starting point of the IoF2020 Project. The guidelines designed will be the reference point for the Trial partners for the whole length of the project, being able to find information about: their role duties, the deadlines to provide the required information for specific deliverables, the frequency and the partners involved in the meetings, as well the documentation criteria, and the communication channels.

Meanwhile, the deliverable “Trial Implementation Guidelines” has enhanced the close cooperation between WP2, trial chairs and use case coordinators. Such cooperation is at the base of IoF2020 Project, assuring the smooth progress of the project through a multi-actor approach, where all the partners, from the end-users to the leaders of work packages, are involved in the development of a successful project. As well, it ensures a bottom-up approach to problem solving, which will ensure very fast responses to possible problems.

ANNEX

TEMPLATE FOR USE CASE MEETING MINUTES

Meeting Name:				
Meeting called by:	<i>Use Case Coordinator</i>			
Date of Meeting:		Time:		
Minutes Prepared By:	<i>Use Case Coordinator</i>	Platform:	<i>(Skype, GoTo Meeting, etc.)</i>	
Facilitator:		No. of attendees		
1. Meeting Objective				
2. Attendance at Meeting				
3. Preparation (documents/handouts to bring, reading material, etc.)				
Description			Prepared by	
4. Agenda and Notes, Decisions, Issues				
Topic:				
Topic:				
5. KPIs update				
Economic Impact	Previous Result (date)	Current Result	Improvement (%)	Target
<i>Name of the KPI</i>				
Environmental Impact	Previous Result (date)	Current Result	Improvement (%)	Target
<i>Name of the KPI</i>				
Other Impact (social)	Previous Result (date)	Current Result	Improvement (%)	Target
<i>Name of the KPI</i>				
6. Next Meeting				

TEMPLATE FOR TRIAL MEETING MINUTES

Meeting Name:			
Meeting called by:	<i>WP2 Team</i>		
Date of Meeting:		Time:	
Minutes Prepared By:	<i>WP2 Team</i>	Platform:	<i>(Skype, GoTo Meeting, etc.)</i>
Facilitator:		No. of attendees	
1. Meeting Objective			
2. Attendance at Meeting			
3. Preparation (documents/handouts to bring, reading material, etc.)			
Description		Prepared by	
4. Agenda and Notes, Decisions, Issues			
Topic:			
Topic:			
5. Trial Assessment			
	Environmental Impact	Economic Impact	Other Impact (social)
U.C. x.1			
U.C. x.2			
U.C. x.3			
U.C. x.4			
6. Next Meeting			

TEMPLATE FOR WORK PACKAGE MEETING MINUTES

Meeting Name:			
Meeting Called By:	<i>WP leader or co-leader</i>		
Date of Meeting:		Time:	
Minutes Prepared By:	<i>WP leader or co-leader</i>	Platform:	<i>(Skype, GoTo Meeting, etc.)</i>
Facilitator:		No. of attendees	
1. Meeting Objective			
2. Attendance at Meeting			
3. Preparation (documents/handouts to bring, reading material, etc.)			
Description			Prepared by
4. Agenda and Notes, Decisions, Issues			
Topic:			
Topic:			
Topic:			
5. Next Meeting			

