



# **D1.6 CONSOLIDATED REPORT ON SYNERGIES WITH OTHER IOT LSPTS**

**WP 1**

30<sup>th</sup> March 2021



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## PROJECT SUMMARY

**The internet of things (IoT) has a revolutionary potential. A smart web of sensors, actuators, cameras, robots, drones and other connected devices allows for an unprecedented level of control and automated decision-making. The project Internet of Food & Farm 2020 (IoF2020) explores the potential of IoT-technologies for the European food and farming industry.**

The goal is ambitious: to make precision farming a reality and to take a vital step towards a more sustainable food value chain. With the help of IoT technologies higher yields and better-quality produce are within reach. Pesticide and fertilizer use will drop and overall efficiency is optimized. IoT technologies also enable better traceability of food, leading to increased food safety.

Nineteen use-cases organised around five trials (arable, dairy, fruits, meat and vegetables) develop, test and demonstrate IoT technologies in an operational farm environment all over Europe, with the first results expected in the first quarter of 2018.

IoF2020 uses a lean multi-actor approach focusing on user acceptability, stakeholder engagement and the development of sustainable business models. IoF2020 aims to increase the economic viability and market share of developed technologies, while bringing end-users' and farmers' adoption of these technological solutions to the next stage. The aim of IoF2020 is to build a lasting innovation ecosystem that fosters the uptake of IoT technologies. Therefore, key stakeholders along the food value chain are involved in IoF2020, together with technology service providers, software companies and academic research institutions.

Led by the Wageningen University and Research (WUR), the 70+ members consortium includes partners from agriculture and ICT sectors, and uses open source technology provided by other initiatives (e.g. FIWARE). IoF2020 is part of Horizon2020 Industrial Leadership and is supported by the European Commission with a budget of €30 million.



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## EXECUTIVE SUMMARY

The IoF2020 project has been embedded in a program for Large Scale Pilots on IoT as one of five Large Scale Pilots working in different sectors. Deliverable D1.6 is reporting on the cooperation with the other Large Scale Pilots and two CSA's in the IoT programma of the EC.

The search for synergy between the LSPs was done in the so-called IoT Cluster where periodic meetings have been organized with participation of the 5 LSPs, the 2 CSAs and the IoT unit from DG Connect. At the start a set of topics have been identified and Action Groups defined around those topics each with a work plan. The full reporting on the activities is done by the CSA's; CREATE-IoT and U4IoT.

For reporting on the activities and results of the IoT Cluster we refer to the CSA reports, this deliverable is focussing on the participation, impact and benefits for the IoF2020 project.

Starting end of 2016 until end of 2019 circa 2 physical meetings per year of the IoT Cluster have been organised and in all of them IoF2020 participated. In the meetings the LSPs presented their activities and shared their experiences. However in the interaction between LSPs, facilitated by the CSAs, the different nature and timelines of the projects made it challenging to work on common topics to create synergy. Most important synergies have been realised in the area of joint communication and the progress in Fiware related standards.

Looking with a rational view at the balance between the IoF2020 time and resources dedicated to the IoT Cluster, and the benefits for the project, it is fair to conclude that for IoF2020 we did not get the benefits we hoped for. On the other hand our commitment to, and participation in the IoT Cluster has been important for the EC to have strong exposure of a coherent IoT program. Last but not least the IoT cluster has also been experienced as an extension of the IoF2020 ecosystem. This has resulted in a new joint H2020 proposal on digitization of the rural area in which IoF2020 teamed up with the ecosystems of two other LSPs; Activage and Synchronicity.

# 1. LSP IOT CLUSTER

The IoF2020 project has been embedded in a wider programme. The IoT European Large-Scale Pilots Programme includes the innovation consortia that are collaborating to foster the deployment of IoT solutions in Europe through integration of advanced IoT technologies across the value chain, demonstration of multiple IoT applications at scale and in a usage context, and as close as possible to operational conditions.

IoT European Large-Scale Pilots Programme includes projects addressing the IoT applications based on European relevance, technology readiness and socio-economic interest in Europe. The IoT Large-Scale Pilots projects, 5 Large Scal Pilots (LSPs) and 2 CSAs, the overview is illustrated in and the areas addressed by the projects is listed below.



Figure 1. IoT European Large-Scale Pilots Programme Projects Overview

Already before the start of the project, in September 2016 a first meeting of the IoT Cluster took place, organized by the CSAs. In this meeting the collective work programme was defined in 8 Action Groups (AGs).

## 1.1 Activity Groups

The ultimate goal of the IoT European Large-Scale Pilots Programme and the coordination/collaboration activities was to increase the impact of the activities and development in the IoT Large-Scale Pilots on citizens, in the public and private spheres, industry, businesses and public services. The activity groups could be key enablers for the identification of key performance indicators to measure progress on citizen benefits, economic growth, jobs creation, environment protection, productivity gains, etc.

The coordination mechanisms implemented through the activity groups was designed to ensure a sound coherence and exchanges between the various activities of the IoT Focus Area, and cross fertilisation of the various pilots for technological and validation issues of common interest across the various use cases. Figure 2 illustrates this mechanism.

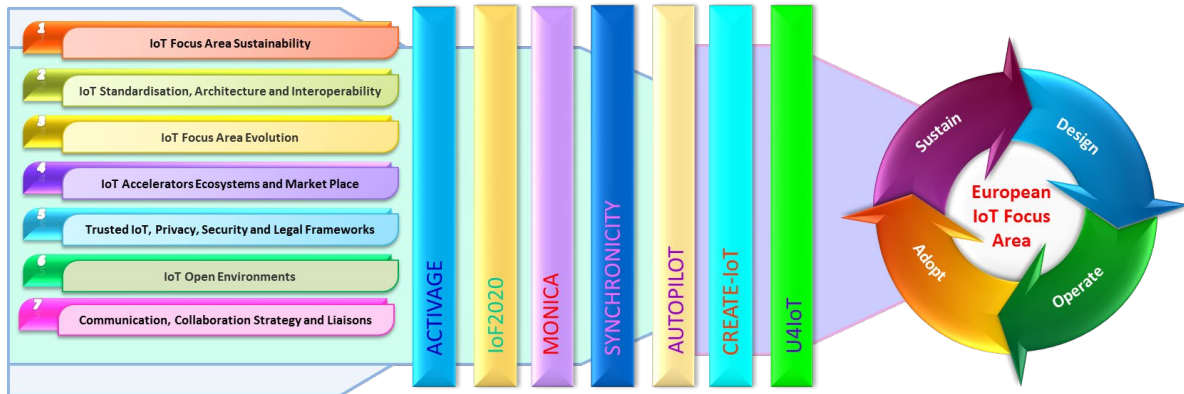


Figure 2 IoT European Large-Scale Pilots Programme Activity Groups

The issues of horizontal nature and topics of common interest, such as privacy, security, user acceptance, standardisation, creativity, societal and ethical aspects, legal issues and international cooperation, are coordinated by the activity groups and consolidated across the pilots to maximise the output and to prepare the ground for the next stages of deployment including pre-commercial or joint public procurement.

From the start of the of the project in januari 2016 until September 2018 the activities of the IoT Cluster were organized in the Activity Groups. Below an overview summarizing the Activity Group objectives, the input by IoF2020 and the relevant output for IoF2020.

### 1.1.1 IoT Focus Area Sustainable

*Objective:*

The objectives include technology assessment and optimisation, business model validation, approaches to sustainability and replicability. The sustainability issues addressed considering validation of methodologies, best practices and business models, a common methodology and KPIs for design, testing and validation across the IoT large-scale pilots projects.

*Input IoF2020:*

No input from IoF2020 because this activity group has not been active.

*Output for IoF2020:*

-

### 1.1.2 IoT Standardisation, architecture and interoperability

*Objective:*

To provide recommendations on the reference implementation of promising IoT standards serving the interoperability and openness objectives. This includes consideration of the validation in usage context of most promising standards and gap analysis identification and addresses interoperability, integration, through open IoT platforms used by the IoT large-scale pilots projects.

*Input IoF2020:*

IoF2020 was joining Activity Group 2 of the large scale pilot projects (LSPs), specifically addressing standardisation. The work was moving towards the topics of interoperability while also reuse of results and replicability of IoT based solutions. As IoF2020 was the project running longer than the other LSPs, IoF2020 was organising 4 workshops between March 2020 and March 2021 on the topic semantic interoperability. Besides the ongoing involvement of colleagues from LSPs, it was also possible to involve additional projects like e.g. ATLAS, DEMETER, OPEN DEI, FAIRSHARE, CYBELE, NGIoT, SmartAgriHubs but also SDOs like AEF, AgGateway and GS1. The last workshop organised by IoF2020 was co-located with the IoF2020 final event on March 17<sup>th</sup> 2021. However, the work will be continued, while being headed after the end of IoF2020 by OpenDEI, ATLAS, DEMETER



and NGIoT. On top of that, all relevant results are compiled in an overview (i.e., the IoF2020 legacy) and were handed over to the SmartAgriHubs project to be integrated in the SAH portal.

*Output for IoF2020:*

In collaboration with Synchronicity, it was agreed that the concept of the so called Minimum Interoperability Mechanisms are combining those aspects in terms of data exchange related standards as well as identifying generic key components that will facilitate especially reuse and replicability. Therefore, IoF2020 as well as Synchronicity were promoting related work as presented for IoF 2020 in the deliverables D3.3 and D3.11 and aligned their work in relation to the standard development organisations and realisation of open source software components.

### **1.1.3 Focus Area evolution activity group**

*Objective:*

To be involved and contribute to the governance of the Digitizing European Industry (DEI) Strategy and to connect with the European initiatives (PPPs, JTIs, EIPs, KICs, EU Smart Specialisation Platform) for defining the developments of IoT technologies and applications in digital technologies and in digital industrial platforms across value chains in all sectors of the economy

*Input IoF2020:*

Not aware of activities in this AG, at least no participation of IoF2020

*Output for IoF2020:*

-

### **1.1.4 IoT Accelerators ecosystems and market place**

*Objective:*

The reference objectives are to identify the existing European ecosystems of accelerators and provide an overview of ecosystems accelerators, the business cases addressed and the deployment sites. Evaluate the existing open APIs and reinforce adoption by providing an overview of API's openness or IPR Level. During the project this activity group focused more specific on exchanging best practices on open calls in the LSPs.

*Actual activity:*

The CSAs provide the LSPs mainly with end-user engagement concepts and tools to perform better end-user acceptance testing and co-development of solutions. This support was mainly targeted towards citizens and included workshop concepts and tools to map various stakeholder interests in an open living lab approach. This support was only of limited use for IoF2020 as our use-case already set up their own feedback and testings structures with test farms and most solutions did not involve the citizen.

Under the input of IoF2020, the group worked on the establishment of better channels and programmes for cross-sectoral exchange. Therefore, the group created together with and managed by BluSpecs a Slack channel and a website for the IoT Next Club.

*Input IoF2020:*

- Material of the IoF2020 Open Call was shared with the other LSPs.
- IoF2020 jointly setup the IoT Next Club Slack Channel and its content
- IoF2020 actively communicated this offer for cross-sectoral exchange to the IoF2020 partners
- Inputs for the website of the IoT Next Club - <https://iotnext.club/>

*Output for IoF2020:*

We received the Open Call material from Synchronicity, unfortunately at that time the IoF2020 Open Call was almost completed. Some IoF2020 SMEs were active on the Slack Channel and received interesting information about funding opportunities. At least in one case this led to an application for funding. Also some best practices exchange took place on the technical level.

### **1.1.5 Trusted IoT, privacy, security and legal frameworks**

*Objective:*

Stakeholders acceptance validation addressing privacy, security, vulnerability, liability, identification of stakeholders user needs, concerns and expectations of the IoT solutions exploitation of security and privacy mechanisms towards best practices and a potential label ("Trusted IoT"). The AG addressed



the issues to build the IoT large-scale pilots. The activities will look at privacy issues and how these can be tackled in an efficient manner in view of the upcoming new regulations

*Input IoF2020:*

No input from IoF2020 side, the Use Cases in IoF2020 were in that phase not yet ready to address these issues.

*Output for IoF2020:*

As listener in this activity group it was valuable to be informed about the relevance of these issues, it created awareness of an additional group of issues that Use Case might need some help on. In the WP3 we were triggered to offer the Use cases a so-called STRIDE analysis, on the security and privacy aspects of the technical part of the solution. The awareness also resulted in implementation of an additional Work Package 7 in the IoF2020 project. This WP has worked on the concept of 'Trust in IoT'. It was concluded that the AG was working from the legal perspective. In IoF2020 we did not see any legal issues and our WP7 has been working from the ethical perspective.

### 1.1.6 IoT open environments

*Objective:*

to address the challenges of dynamic and evolving environments, generating high-volume streams of heterogeneous correlated/non-correlated contextual information of varying quality and complexity considering the increase in user mobility and unreliable sensors/actuators information in IoT, taking into account the context-aware applications to dynamically adapt their behaviour at run time. This AG was during the project renamed in 'IoT urban context'.

*Input IoF2020:*

No activities in this activity group.

*Output for IoF2020:*

-

### 1.1.7 Communication, collaboration strategy and liaisons

*Objective:*

To design and implement the communications strategy to coordinate and support the IoT European Large-Scale Pilots Programme communicate effectively and meet core programme objectives. These include key elements of a communications strategy, common web portal, events, branding, awareness, press/PR plans, web strategies and marketing plans.

*Input IoF2020:*

The IoF2020 communication strategy and instruments and results have been shared with the other LSPs. It was clear that the IoF2020 communication was more advanced than the other LSPs. To really brought the IoT Cluster communication to a higher level, in terms of joined activity as well as quality, WP5 team of S&P took over the coordination of this activity group in January 2018 by contract for a duration of 6 months. In fact this has been the only AG that was active until end of 2019. Under chair of IoF2020 the presentation of the IoT Cluster at the IoT week in Bilbao (June 2018) and Aarhus (June 2019) was prepared and joined material was made available. In addition, upon request of the DG CNECT, a selection of LSP (IoF2020, Synchronicity and ActiVage) organised a joint participation to the ICT Vienna congress. The common booth was visited by Pierce O'Donohue director general of DG CNECT. The AG also delivered an e-book with title "The EU IOT LSP Program – Making the difference in Europe". Also, in order to reach a wider audience, the AG produced a "reader friendly" booklet explaining what is IoT and how the end user would benefit from it in the everyday live associated to an animation video.

- [IoT large Scale Pilot Programme booklet](#)
- [Animation video](#)

*Output for IoF2020:*

A better presentation of the IoT Cluster also supports a better and larger exposure of IoF2020.

### 1.2 Reflection LSPs on Activity Groups

In the IoT Cluster meeting in April 2018 it was put on the table that the LSP leaders were not happy with the performance of the activity groups. For the LSPs the balance of cost-benefits was too much on the cost side. The members of the LSP teams that have been participating in the AGs were losing interest and motivation.

From the LSP perspective it appeared that the CSAs had their own objectives, milestones and deliverables which are prioritized in the plans and execution of AGs actions. However it was concluded that these priorities were not in line with the needs and interest of LSPs and there was no effort in adapting and aligning objectives and approaches, thus creating redundant work, without added value for the LSPs. This was also related to a deficit in the quality of project management and internal communication at CSA side.

### 1.3 Topic driven approach

On the other hand the LSPs also concluded that there are quite some topics where LSPs can have good benefits from cooperation. The identified and prioritized these points (see annex 1), to work on them and look for persons in the CSAs/AGs that are willing and competent to help on realizing these.

The LSP propose a 'topic driven' approach with relatively short actions (sprint teams) on topics that had a shared interest and where cooperation adds value.

It seemed that the timing of the intervention was somewhat late. CSAs still insisting on the original structure with broadly defined activity groups. It also became apparent that without the support of CSA the LSPs did not manage to work on the topics. Discussions around a table in Brussels were very promising. However back the reality is that priorities are dominantly at the managing the always present challenges in the 'own' LSP.

At the 2<sup>nd</sup> half of 2019 the joined activities more or less stopped, also due to the fact that 4 of the LSPs were in their final stage, with (logically) all attention and effort on finalizing the project.

One absolute important impact of the IoT Cluster activities is in the Ecosystem dimension. Because the LSP teams had spent quite some time together in the various meetings there emerged relations that would lead to future cooperation. In 2020 Synchronicity, Activage and IoF2020 teamed up to prepare together a proposal for a H2020 call on digitization in the Rural area. Despite this proposal didn't make it, this joint effort made the floor for further cooperation between those ecosystems.

## 2. COLLABORATION DIGITAL AGRI PROJECTS

As the IoT LSP Cluster ended in 2019 during 2020 a new CSA was established, Open-DEI. In this CSA it was foreseen to support a cluster of LSP that are working digitization in AgriFood. In May 2020 there was a meeting organized with five LSP on this domain; ATLAS, DEMETER, IoF2020, SmaertAgriHubs and AgroBoFood. In this meeting a large number of topics with potential on cooperation were identified; see annex 2.

The idea was to have these topics prioritized which would be input for a joint activity plan coordinated by Open-DEI. A bilateral meeting with Open-DEI on this first topic list did not result in a follow-up. So unfortunately there was no follow-up on this activity until February 2021 where a webinar was organized where IoF2020 has been presented.

### 3. CONCLUSION

In IoF2020 we were really committed to search for synergy with other projects and we have been very open in sharing ideas, experience, results etc., and looking for added value of cooperation. We dare to say, we really tried.

It must be concluded that cooperation between H2020 projects and to really realize synergy is not that easy. Even if the potential benefits are quite clear, and a supporting infrastructure is made available it is difficult to create synergy. There are a number of reasons that can be brought forward based on our experiences in IoF2020:

- Priority for 'own' activities when benefits for cooperation are not directly visible or not helping to solve an actual problem in the project
- Timing of joined activities needs to be aligned with phase and activities in the projects
- When there is a difference in quality on specific topics (because of role and importance might differ) there is inequality in the relation between LSPs that hampers fruitful cooperation
- Maybe personal characteristics in terms of open attitude and social skills
- Cost-Benefit of cooperation and project responsibility for allocating of resources
- Project quality for joint activities

Despite the somewhat disappointing results of cooperation as an organized action plan, we need to consider that there are quite some informal interactions between persons from different LSPs and individuals that were involved in different LSPs. Especially between Synchronicity and IoF2020 there has been more contact and we contributed in each other's events. These contacts definitely resulted in a form of synergy that is difficult to trace and/or to formalize but needs to be recognized as an important 'intangible' impact related to connected IoT ecosystems.

# ANNEX 1

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## TOPICS FOR COOPERATION FOR COMING 4 MONTH - DEMANDED BY LSPs

Scores for LSPs:

0 = not interested, not now

1 = slightly interested for limited participation, maybe later

2 = interested to participate

3 = priority, if needed prepared to initiate

Topic	ACTIVAGE	AUTOPILOT	IOF2020	MONICA	SYNCHRONI-CITY	LSPs total
Open Call – selection procedure	1	0	1		1	
Booklets for LSPs	1	0	0		0	
Meeting European Parliament	2	1	2		3	
Standardisation & Interoperability	3	3	2		3	
KPI's for Cluster	2	0	0		1	
SME engagement	1	2	0		2	
Market places for data	2	3	2		2	
Business Position Paper	2	2	0		0	
Ethics - active approach	2	1	3		2	
Reporting GDPR	2	1	2		2	
Demonstration at community level		1	0		2	
Security	2	2	2		1 (or 3, depends)	
ICT & Arts	0	0	1		2	
Trust in IoT	2	2	1		2	
Multimedia marketing material	2	1	2		2	
Platforms			2			
Catalogue/Market place re-usable comp.			3			
Education			1			
Women inclusiveness						

## ANNEX 2.

### DEI LARGE SCALE PROJECTS IN AGRIFOOD SECTOR

#### TOPICS FOR COOPERATION

Scores for LSPs DIHs:

0 = not interested, not now

1 = slightly interested for limited participation, maybe later

2 = interested to participate

3 = priority, if needed prepared to initiate

Topic	ATLAS	DEMETER	IOF2020	SAH	AgROBOfood	Which role do you expect from OpenDEI?
1 Communication						
1.1 Common communication platform						
1.2 common communication strategy						
2 Open calls						
2.1 Sharing advisory board members						
2.2 Sharing standard Call package						
2.3 Sharing short list of evaluators						
3 Use Case explorer						
3.1 Sharing case descriptions						
3.2 Sharing case specifications						
3.3 Sharing business models						
4 shared infrastructure						
4.1 Data infrastructure						
4.2 Data market place – develop models showing						

value for communities						
4.3 Sharing KPI definitions and methods						
4.4 Sharing templates for Use Case monitoring, assessment and feedback						
5 Linking eco-systems						
5.1 Combine kick-off meetings with public part						
5.2 Organise common events						
5.3 sharing dissemination events with project active participation						
5.4 Share communities of the 3 platforms						
5.5 Synergy between Use Cases (bring UCs together)						
6 technical topics						
6.1 Architectures						
6.2 Cooperation on standards						
6.3 Re-usable Components						