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WP6

Annual report #1 on exploitation activities incl. plan for subsequent phase

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Abstract

In this document we report on early exploitation activities that were carried out by FED4SAE project partners during the first year of the project. Furthermore, the document provides an update of the initial exploitation plan of FED4SAE, as described in the project deliverable D6.3.

The project's exploitation strategy addresses three main tracks: the exploitation of the CPS technologies that are available in the project and offered to third parties in application experiments, the leverage on the communities and ecosystems that exist around FED4SAE DIHs and that will be extended and reinforced, and ensuring sustainability of the FED4SAE DIH network and the innovation services it can offer to European businesses.

The exploitation plan will be further updated annually as the project progresses and where refinements are made based on progress made and lessons learned.



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1 Introduction

The overall ambition of FED4SAE is to boost and sustain the digitization of the European industry by strengthening competitiveness in Cyber Physical Systems (CPS) and embedded systems markets.

In alignment with the “Smart Anything Everywhere” initiative goals, FED4SAE aims to:

- Create a pan-European network of Digital Innovation Hubs (DIH) by leveraging existing regional ecosystems across value chains and a range of CPS competencies. These DIHs will enable both tech and non-tech innovative businesses (Start-ups SMEs, Midcaps) from any sector to build new products and services with “digital inside”.
- Act as a European added-value one-stop shop to facilitate cross-border partnerships between innovators and suppliers to accelerate innovation in products and processes of European businesses. This is enabled by providing technical, industrial and innovation management expertise to businesses for increases in market shares, productivity, and a broader adoption of CPS and embedded systems solutions.
- Facilitate links between innovators and investors associated with DIHs to reach out to further funding opportunities and accelerate commercialisation.
- Ensure the self-sustainability of the DIH network by developing cooperation with regional organizations and key stakeholders engaging public and private investment to fund further activities after project completion.

FED4SAE will give birth to a competitive ecosystem where European Start-ups, SMEs and Midcaps will thrive as they access to leading technology sources, competencies and industrial platforms and also to well-connected business infrastructures and existing regional innovation hubs.

1.1 Task objectives


To achieve the ambitious goals of FED4SAE and to maximize the industrial uptake, impact on targets, and outreach of the results, whilst ensuring the long-term sustainability and growth of major project outcomes, FED4SAE defines and continuously evolves a comprehensive set of strategic exploitation activities.

FED4SAE has a large potential market, a differentiated offering, significant potential profits, a highly skilled team and a scalable business model: all these elements can guarantee the outcome of the project finding easy entrance into the market, boosting EU competitiveness and growth. Potential customers identified by FED4SAE are distributed globally with strategically important markets. FED4SAE is targeting tech and non-tech Start-ups, SMEs and Midcaps that need support in accessing technologies, expertise and innovation management services.

The exploitation activities are closely linked to the project’s dissemination actions, which ensure that all relevant communities are broadly aware of FED4SAE offerings and results. Hence the exploitation work is placed together with the dissemination activities in a dedicated work package (WP6 “Creating cross-border CPS and Embedded System DIH, Dissemination and Exploitation”) with participation of all project partners; this will ensure that the exploitation activities are carried out with the same level of commitment as technical work. A major objective for FED4SAE is to facilitate pan-European benefits from the project outputs and results.

Overall, the exploitation strategy has the following dimensions:

- For FED4SAE partners that are providers of CPS and Embedded System platforms
 - It will enable new use cases and more platform sales,
 - Additional insights about end users which currently only the distributor captures,

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- For FED4SAE partners that are advanced component providers (RTOs and Technology transfer-oriented university institutes),
 - Maturation of advanced enablers towards increased market readiness,
 - Industrial transfer opportunities through third parties.
- For FED4SAE DIHs,
 - New capabilities and increased competitiveness through partnerships in federated networks allow to provide more holistic services to local Start-ups, SMEs, Midcaps (better services for local businesses, better access to future funding and commercial contracts),
 - Easier market entry to other EU countries through federated hubs,
 - Funding to help local CPS and Embedded System sector grow,
 - Third party growth - new products, services and scale-up opportunities supported in the region.

Alongside the growth of major project outcomes, FED4SAE will adopt and exploit the results in a sustainable way during and beyond of the project scope to ensure the long-term sustainability. The business model of FED4SAE self-sustainability will rely on the setting-up of a public/private co-financing of the action to further apply the cascade-funding scheme.


1.2 Purpose of this document

The aim of the exploitation plan is to define the specific goals for exploiting both the innovative solutions created by FED4SAE application experiments and the further valuable assets available to FED4SAE DIH network, and to devise strategic actions to achieve those goals to ensure high impact of the project outcomes.

This document constitutes an update of the initial FED4SAE exploitation plan that has been defined at project start and is to be understood in connection with the strategies set out in deliverable D6.3. Notably, the present document provides refinements of the individual exploitation strategies of the FED4SAE project partners that particularly take into account specific needs and opportunities provided by the first set of application experiments that have been selected in the Open Calls and started during the first year.

Moreover, we report on early common exploitation activities carried out by the project consortium during the first year of the project.

The project exploitation plan will be continuously updated and refined based on progress of the project and lessons learned.

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2 Progress on overall exploitation

As described in the initial exploitation plan, deliverable D6.3, the FED4SAE exploitation strategy builds on three main pillars:

1. Exploitation of CPS technologies and application experiment results
2. Community and ecosystem building around FED4SAE DIHs
3. Ensuring sustainability of the FED4SAE DIH network and its services

During the first year of the project, FED4SAE has carried out various activities along each of these axes, with an emphasis on the first and second item.

Regarding the **CPS technologies and application experiments**, the first group of SMEs has been selected from the Open Call and first experiments have been started. The dedicated activities to help exploit eventual experiment outcomes are reported by the owners of the individual industrial platforms and advanced CPS technologies in Section 3.


Community and ecosystem building activities have also further progressed. Besides local efforts of FED4SAE partners to establish new links to relevant stakeholders and communities in their respective regional ecosystems, cf. also Sect. 3, the FED4SAE consortium has gathered information about the structure of the ecosystems surrounding the Digital Innovation Hubs of FED4SAE, aiming at understanding who are the main entities in the ecosystems, how they are connected to each other, and which different learning opportunities exist within the ecosystems. The goal of these activities are to identify learning needs and potential gaps in the learning market that could eventually be addressed by the FED4SAE DIHs. Having an analysis of which learning opportunities are available and an indication of which are the most valuable to whom, will provide an additional way of supporting SMEs with training and education services that are tailored to their needs. This will particularly be targeted towards SMEs that have proposed experiments in the Open Calls but have not been selected. Further details about the current state of the ecosystems activities are reported in the project deliverable D6.5.

Further progress has also been made regarding establishing CPS Digital Innovation Hubs in FED4SAE. Meanwhile, five of the eight RTO partners of the FED4SAE consortium are hosting or are closely connected to a DIH, which are registered in the EC's DIH Catalogue:

- CEA are partner of the Minalogic DIH
(<http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/1297/view>)
- Digital Catapult
(<http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/1317/view>)
- fortiss are partner of and hosting the Munich Innovation Hub for Applied AI
(<http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/12409/view>)
- KTH are serving as the KTH Innovation Hub of Digital Industrialization
(<http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/5792/view>)
- University of Cantabria are hosting the IoT-SmartSantander DIH
(<http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/1372/view>)

Building on these DIHs will allow the FED4SAE network of DIHs to provide a comprehensive set of innovation support services to SMEs across Europe. Further efforts will be made to establish closer collaboration between the individual DIHs where SMEs can access services from another DIH in the network in cases where such a service is not available in the SMEs' regional DIH.


Another important element of the community building activities is building links to other relevant DIH efforts and projects. Here FED4SAE is particularly involved in the Smart Anything Everywhere (SAE) and I4MS communities and has further progressed creating valuable connections. In SAE, FED4SAE coordinator CEA are a key actor to foster collaboration among the SAE cluster projects by steering such

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activities via the Smart4Europe Coordination and Support Action. Besides common outreach activities emphasis is also given to collecting experiences and best practices regarding innovation support for SMEs, specifically concerning mechanisms such as Open Call experiments and financial support.

Furthermore, FED4SAE partner fortiss has been contributing experiences gained through various SAE and I4MS projects to the final Platforms4CPS report on *Key Outcomes and Recommendations* (available at <https://www.platforms4cps.eu/>), including a strong support for strengthening and broadening DIH initiatives.

Finally, first steps have been undertaken to address the **sustainability of the FED4SAE DIH network**. Here, FED4SAE has undertaken analyses towards developing a blueprint of a business model for DIH, building on information and experience exchanges with partners of other SAE projects via the CSA, and by actively participating in relevant EC-level events, such as the DIH annual event in Warsaw 2018, and in meeting of the DIH working group.

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3 Initial exploitation activities and refinements of exploitation plans

In deliverable D6.3, the FED4SAE project partners have devised detailed plans for their individual exploitation activities, which build on both their particular expertise in a wide range of CPS technologies and application domains as well as their strong involvement in local and regional ecosystems.

This section reports on the various exploitation activities carried out by the FED4SAE project partners during the first year of the project. Activities comprised, for instance, further maturing the partners' technologies, increasing their uptake and growing the respective user bases, creating and intensifying links to stakeholders within their local innovation ecosystems to facilitate connecting CPS innovators to resources and services available within these ecosystems.


Furthermore, this section provides updates and refinements of the individual partners' exploitation strategies, taking into account both progress made so far and specific new needs of SMEs participating in recently started new application experiments and related opportunities.

3.1 CEA

3.1.1 Exploitation activities carried out in Year 1

During the first year, CEA-Leti in close collaboration with Minalogic has participated to some dedicated networking events in order to promote FED4SAE open calls among the French SME ecosystem, with a dedicated focus on the regional ones. These events gave the opportunity to discuss with interested SMEs, to participate to matchmaking events and to have connection with some innovation management / business support associations for wider promotion of FED4SAE:

- Participation to Minalogic event "Journée thématique Cyber-Physique" - November 16, 2017 in Grenoble: poster presentation and one-to-one discussion, 25 SMEs present
- Participation to Techinnov 2018 "Une journée 100% business et innovation" – February 8, 2018 in Paris: booth and networking session (1500 companies – SMEs, midcaps, start-ups attending the event – and 20 one-to-one meetings about FED4SAE open call opportunities), speaker corner slot to present Cascade Funding opportunities.
- Participation to SIDO 2018 "The IoT showroom" – April 4-5, 2018 in Lyon: booth and networking session (a dozen one-to-one meetings with start-ups and SMEs).
- Participation to the SMART AND DIGITAL FUTURE Vienna - Brno - Bratislava, 20/09/2018, Vienna where SAE initiative and associated open calls were presented. The 72 attendees included 43 companies (and 12 start-ups among them). FED4SAE discussed with 10 companies (one-to-one discussion) during the networking slot.
- Thanks to Minalogic connection, FED4SAE open calls are promoted in French language through the H2020 National Contact Points for ICT and SME. Promotion included posts in their newsletter, posts on social media with their specific accounts and direct promotion in one information event dedicated to cascade funding that took place on November 8th in Paris. This event gathered 65 participants among them 25 SME.
- FED4SAE open call and cascade funding opportunities were presented to CEA-Tech regional branch offices in order to promote more actively SAE initiative in the regions where CEA-Tech is present: Aquitaine, Lorraine, Midi-Pyrénées, Nord-Pas-de-Calais, PACA and Pays de Loire, early January 2018.
- Minalogic highlighted FED4SAE open call results by posting Wegoto CEO interview on its website (Wegoto is a French start-up, member of Minalogic network and awarded through FED4SAE 1st open call for the project CADIX involving CEA-Leti and ST-I), <https://www.minalogic.com/fr/actualite/fed4sae-wegoto-obtient-un-financement-europeen-pour-son-projet-cadix>.

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3.1.2 Update of individual exploitation plan

To strengthen or create new collaborations with Third parties, to extend its ecosystem to reach more Third Parties is the mission, of CEA Tech, part of the DNA of CEA, based on its excellence and also on its capacity to handle innovation transfer to its industrial partners.

CEA works closely with Minalogic (Global Innovation cluster for digital technologies serving France's Auvergne-Rhône-Alpes region) to boost the ecosystem, promote SAE initiative. Whereas CEA brings its advanced technologies and expertise, Minalogic brings in-depth knowledge of the regional ecosystem, in-depth knowledge of the local SMEs and ability to connect actors together to promote adequately the SAE initiative and FED4SAE call opportunities.

The opening of the Open Innovation Centre in Q3 2019 will foster and reinforce the synergies of these two classes of services. (The first foundation stone was laid on September 25, 2018.) The OIC will offer a unique infrastructure providing networking, expertise equipment, creative methodologies, innovative space and a full range of services offering to ramp-up innovation and propose immersion in the world of innovation to technical component. The premises should be ready by April 2019.

Through FED4SAE first two open calls, CEA together with Minalogic and the OIC are fostering activities/services to be offered to interested innovative companies among other parties. These services illustrate the role to be of Minasmart, the Auvergne-Rhône-Alpes Digital Innovation Hub (DIH) recently created:

Access to Technologies


- CEA has created new collaboration. The three companies (Wegoto, Artomatix and Surewash) have never worked with the CEA-Leti before. Wegoto is a French start-up located in the local ecosystem, they are member of Minalogic network and their FED4SAE project "CADIX" was promoted on Minalogic website. Artomatix and Surewash are both based in Ireland and took contact with the CEA thanks to FED4SAE open calls and the support of FED4SAE Irish partner, Intel. CEA-Leti is supporting the granted projects up to demonstrator/proof-of-concept phase in order to serve as attractive showcases and assets for that purpose, and that could benefit for both the innovative companies and the CEA-Leti awareness.
- Set-up of collaborative research on three different CEA advanced technologies has been defined thanks to the three selected projects dealing with technology transfer, concept validation and prototyping, testing and validation.
 - Optimized compression technics
 - SigmaFusion© technology
 - Evaluation of prototype in the IRT-Nanoelec testbed facility. Functional test will include privacy and cybersecurity compliancy assessment as well as usage analysis and user acceptance with potential customers.

These collaborative research is a way for CEA-Leti to promote its advanced technologies and testbed, to extend their functionality or adapt it to further use cases and increase their data base and thus strengthen their usage.

KPI: Number of SMEs selected from Open Calls building innovative use cases exploiting the DIH-supported Advanced CPS Technologies. **Target:** 3

Access to knowledge

- Whenever it is possible, the collaborative research will be accompanied by skill development support when the Third Party has the available resources and perspective in line, when CEA can involve a student, trainee or apprentice to work on the granted projects.

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Access to funding

- Support to better define product usage and market needs can be provided, example with the project “Surewash” (Glanda company) thanks to IRT Nanoelec: a potential user “Korian Group” (private nursing homes and rehabilitation clinic) was contacted, a demonstration of the actual Surewash product was organized at Korian Les Granges (rehabilitation clinic close to Grenoble) which yielded very rich feedback and a follow-up meeting in Paris is organized.
- Because of its financing strategy (for instance EasyTech programme), the Incubator/Accelerator support is devoted to French Companies.
- CEA Open Innovation Centre (OIC) team is taking the opportunity of FED4SAE to roll out its activity in a European and cross-border context, dealing with SMEs outside Grenoble ecosystem and FED4SAE partners. In particular, in collaborations with FED4SAE consortium, CEA OIC team will define a design-to-cost methodology that will be tested on FED4SAE granted projects. This will result in defining common notions and wording, and providing a unique testing opportunity/feedbacks/improvements thanks to the large variety of application/technology/projects characteristics, to be capitalized in best practises guidelines.

KPI: Number of companies successfully receiving new funding/successfully connected to new customers through DIH activities. **Target:** 1-3.

Ecosystem building

- In 2018, Minasmart, Auvergne-Rhône-Alpes Digital Innovation Hub (DIH), was created gathering the major regional actors capable to provide the most complete bunch of services to support tech companies in their development and more traditional ones in their digital transition. FED4SAE has been selected as one of this service provided by CEA. Like this, the project is well identified and further promoted by all other regional partners mainly: Clusters, Regional Innovation Agency. Thanks to joint regional efforts FED4SAE is also now well referenced at the Regional Council. This is a major step towards a sustainable synergy of funds offering regional SME complementary regional/national and EU funding for their projects. SAE initiative and FED4SAE project constitute a solid base of discussion providing concrete examples of collaboration and foreseen impacts, especially when relying on SMEs known by both parties.

KPI: Number of individuals actively engaged in the community. **Target:** 30-50 new per year.


To summarize, CEA-Leti together with Minalogic and OIC is actively proposing a set of services that could be referred as TECHNOLOGY services (fundamental for a RTO and part of CEA Tech DNA) and is developing new services in connection with the ECOSYSTEM development:

- TECHNOLOGY services: collaborative research, concept-validation & prototyping, testing& validation, education and skills development.
- ECOSYSTEM development: creation of Minasmart DIH, ecosystem building, brokerage and networking, mentoring, incubator/accelerator support, open innovation support, Access to Funding and Investor Readiness Services.

3.2 Intel

3.2.1 Exploitation activities carried out in Year 1

In the initial FED4SAE Proposal, Intel had proposed to seed a range of developer boards into the FED4SAE Project however due to changes in the Intel Product roadmap these were replaced by two alternative and more sophisticated platforms (a) the Neural Compute Stick targeting Artificial

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Intelligence primarily Computer Vision applications and (b) the Intel Compute Card targeting small form factor potentially mobile edge compute workloads into and into the FED4SAE Programme.

In 2017, both of these Intel CPS platforms were new offering into market place. As the NCS was launched in [July 2017](#), the Movidius Compute Stick didn't have a large established European ecosystem that had a track record of developing and bringing products based on this platform to the market. Also as it was a radically new non x-86 Computer Architecture and focused on enabling and a whole new class of AI edge workloads, a significant effort would be required to secure the lighthouse platforms that showcase how the platform could be exploited in enabling novel use cases such as Drones, Intelligent cameras, etc. Almost simultaneously, a number of global solutions were launched into market at that time from [DJI Drones](#), [Hikvision Camera](#) and [Googles Clips](#) "always on" Camera showcased those reference designs. However Intel's longer term strategy is to democratise AI by providing a suite of software (such as Openvino) for both training and inference hardware (VPU, CPU, FPGA's and new architectures) platforms thus enabling developers to deliver novel smart solutions from across the portfolio of edge, fog, client, cloud in every domain.


The unique selling point for the Neural Compute Kit is to enable rapid prototyping of low cost, low power smart intelligent devices that utilise the power of AI inference at the edge of the network to drive innovation. As the reader is well aware, the edge compute model avoids the latency issues, reduces the infrastructure and communications overhead costs, avoid data privacy / security and data storage challenges inherent with the transmission of data to and from the Cloud.

For Intel, the FED4SAE Programme is attractive in that it enables it to reach the startup / SME communities that Intel strategically does not normally directly focus on or engage with. Following restructuring in 2016, Intel now directly targets and engages with the larger established tier 1 and 2 organisations that have the resource required to bring products to global market at scale and uses the distribution channel partners from distributors and system integrators to address the wider mass market adoption in which these startup and SME's typically reside. This tiered business model is driven by the economics of silicon manufacturing where high volume is essential to justify the huge multi billion euro capital investments into fabrication facilities.

While it is at an early stage in the FED4SAE Programme, it is important highlight some specific areas of exploitation as a result of Intel's participation in the FED4SAE programme. Of course, early on in the project, we engaged and raised awareness and presented the programme both internally – primarily to Intel's Sales and Marketing Employee across the region but also external partners – i.e. Dell, AAEON etc., and National Agencies whose role is to support the SME who are potential beneficiaries in the programme such as Enterprise Ireland, Ireland Research and Development Group (see example presentation at Industry Event in Cork Ireland - jump to 1:20min [into video of presentation](#)), Social Networks Twitter and LinkedIn [EMVA - European Machine Vision Association](#) or the [BigData Value Association](#) etc..

As a result of wide awareness raising of the Programme and the platforms, it has certainly helped raise awareness of Intel's AI Strategy and specifically the Myriad Technology in the Neural Compute Stick and there has been many enquiries about the new product – for example a number of companies have not applied to the FED4SAE Programme and just directly purchased the NCS device for their own evaluation purposes from the distribution channels ([Mouser](#), [RS Components](#), [Amazon](#) etc.). There is no doubt that some of these will lead to follow up engagements which will be supported by our European partners such as [AAEON](#) or [AIM2.IO](#) but unfortunately these are not directly traceable back to a FED4SAE engagement.

Based on a desire to develop the European Ecosystem around the Myriad and accelerate European innovation, in October 2018, Intel launched its first artificial intelligence for computer vision incubator programme run at [Talent Garden Dublin](#), a co-working campus based at Dublin City University's

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innovation campus, DCU Alpha. The new Dublin campus provides flexible work space for freelancers, tech start-ups and corporate innovation labs, with capacity of about 400. Talent Garden, which was founded six years ago in Milan, is home to more than 3,500 tech professionals across 23 campuses in eight European cities. It is also opening shortly in San Francisco and in Tel Aviv. Talent Garden is like a club in that members select who can join, with the selection criteria based largely on those that can bring the most value in terms of collaboration.


The Talent Garden selects companies that are serious about bringing innovation to market and one of the successful FED4SAE applicants called “Aerodrums” based in Liverpool, UK, applied to join and was selected into the programme. This is a great win-win for both Intel and Aerodrums. The Aerodrums team will get to work with Intel Engineers developing the Myriad Products, to develop and optimise their application on the latest Myriad2 VPU. Intel can also assist with access to the China Tech ecosystem to get prototypes or final product manufactured and delivered globally.

3.2.2 Update of individual exploitation plan

So in the first call we connected with a broad range of companies and these organisations proposed to combine Intel platforms with other advanced technologies

As a result of the first and second FED4SAE calls, there were (13 + 19) 32 applications for Intel platforms - the bulk of which, as we expected referenced the Neural Compute Stick. The graphic below shows the range of funded Projects based on Intel CPS Platforms.

Funded Project 1	Funded Project 2	Funded Project 3	Funded Project 4	Funded Project 5	Funded Project 6	Funded Project 7	Funded Project 8	Funded Project 9
Video Upscaling	Hand Hygiene	AR/VR Learning	Virtual Drums	Industrial Baking	Melanoma Detection			
								
Artomatix	Surewash	Immersive Learning	AeroDrums	Hypercook	SpectroX	Apr 2019	Apr 2019	Apr 2019
NCS	NCS + CC	NCS	NCS	Compute Card	NCS			
CEA Video Compression Algorithm	CEA Nursing Home Testbed	KTH AIDE Platform	BME Harsh Condition Testbed	CSEM Hyperspectral Camera	CSEM Hyperspectral Camera			
Reduced Network Traffic by Upscaling Video Content at the Edge	Reduce Hospital Acquired Infections through Hand Wash Monitoring	Personalised Learning & Training using AR/VR Technologies	Motion Track Virtual (quiet) percussion instruments (Drums)	Cooking monitoring by hyperspectral imagery & control	Next Generation Hyperspectral Dermoscopy System			
In Progress Jul-19	In Progress Jun-19	Jan 19-Aug 20	Jan19-Jan 20	Feb 19-June 20	Jan 19-Aug 19			
1m+ unit TAM  Large market potential if they can develop AI video upscaling algorithms. Need to demonstrate their ability to get attention.	1m+ unit TAM  Very Novel and compelling Business case - if they can prove the business case for hand hygiene to reduce Hospital acquired infections	100K+ unit TAM 100K TAM if they can master data fusion approaches to AR Learning. High Risk immature Science- needs more research	100K+ unit TAM  Novel, Disruptive successful SME with great potential to address adjacent markets. Good showcase use of Myriad VPU	100K+ unit TAM Applying good science to automate QA in industrial baking has a large TAM however need to control ingredients, recipe and process	1m+ unit TAM Early stage detection of Melanoma is potentially disruptive. TAM is professionals and eventually consumer device.			


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Some of the quantifiable exploitation goals of the programme are as follows:

		Target		Exceeds	Outstanding
No	Key Performance Indicator	Neural Compute	Compute Card		
1	Leverage the FED4SAE Network to help raise awareness of AI and the NCS. Reach communities that Intel ecosystem of partners may not reach.	Identify innovation clusters or communities, centres of excellence in Europe.		Reach Research Community and enable a relationship with a World Class European Centre of Excellence in AI research & development.	Seed the Intel Architecture to form the basis of AI Research or a really novel application
2	Applicants : Successful Ensure that there are minimum number (N ¹) of applications and that at least (N ²) Application Experiments are funded on the platform.	20 Proposals submitted based on the NCS of which 6 were successful.	7 Proposals submitted based on the Compute Card of which 2 were successful.	Collectively 30 Proposal Applications for Intel's platforms in the programme.	40 Proposal Applications for Intel's platforms in the programme.
3	Novelty : Identify SMEs targeting disruptive use cases that exploit and showcase the platform is some novel way – this could be targeting a new market or a different approach to an existing market. Ideally they should have some patents to protect their IP Innovation in the platform.	2 successful proposals that target novel Use case – new markets	1 Successful proposals that target novel use cases.	4 Novel Use Cases that are good exemplars that exploit the Myriad VPU are targeting new markets	6 Novel Use Cases that are good exemplars that exploit the Myriad VPU are targeting new markets
5	Complete pilot deployments with real world customers within one year of completing their FED4SAE Project.	4 Pilots	2 Pilots	7 Pilots	9 Pilots
6	Get to market within 18 months of Completing their FED4SAE Project – ideally these will be based upon partners' standard boards to get to	2 Myriad based Product Launched into the Market	1 Compute Card/NUC based Product/Service Launched	3 new Products / Services Launched based on the Myriad VPU.	4 new Products / Services Launched based on the Myriad VPU.

Dissemination level: public (PU)

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	market – custom board development will of course delay market entry but may be an essential differentiator for some applications.		into the Market.		
4	<p>Sustaining Digital Innovation Hubs</p> <p>While there is significant exploitation ecosystem in Asia that have brought products to market, this KPI goal is to help enable a dynamic European Ecosystem to identify innovation clusters, hardware accelerators or communities/ DIH centres of excellence in AI can exploit NCS/Myriad VPU, that supports startups or spinouts, and potentially identify compelling features that can help influence the product roadmap.</p>	Identify a Digital Innovation Hubs that has developed a competency in AI and act as a centre of excellence to support their ecosystem based on Intel's Product line.	There is an established network of System Integrators for the Compute Card.	Identify two partners Digital Innovation Hubs that have develop a competency in AI and act as a centre of excellence to support their ecosystem based on Intel's Product line.	Identify three partners Digital Innovation Hubs that have develop a competency in AI and act as a centre of excellence to support their ecosystem based on Intel's Product line.

While such quantifiable goals are important , obviously finding that one key disruptive company that revolutionises their industry and scale globally would really exceed all our expectations - be that in video communications (Artomatix) or Healthcare (Surewash or SpectroX) or Entertainment (AeroDrums) or Baking (Hypercook) or Education(AR/VR)


3.3 ST-I and ST-F

3.3.1 Exploitation activities carried out in Year 1

In the first year of the project, FED4SAE activities allow ST-F and ST-I to:

- Foster the SMEs' innovative ideas;
- Recognize possible constrains, obstacles and limitations on adoption of our solutions on mass market;
- Reinforce our propositions on mass market, better addressing the needs of (customer) third party;
- Nurture continuous and trusting affiliation relationship with them.

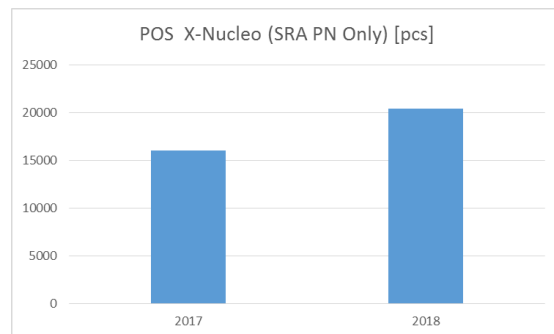
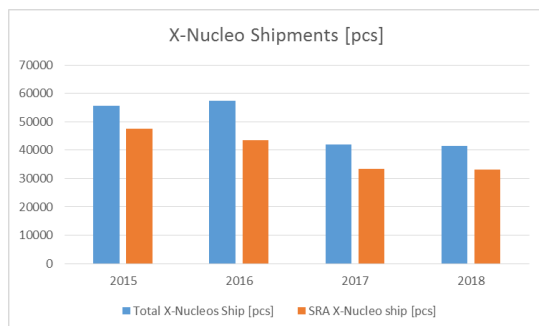
In particular the activity was totally aligned with the scope of the Global Sales & Marketing (GSM) organization of ST and its System Research and Application (SRA) group that within FED4SAE project

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has been named ST-I. Our mission is to support ST's sustainable profitable growth through a successful, end-to-end customer engagement journey, and in particular SRA supports all that by an application-oriented approach aimed at promote and selling more of ST's portfolio.

SRA provides support and expertise to the ST's product groups to define, execute and deploy ST's application strategy, while providing technical marketing services for application related collateral. SRA co-ordinates cross-company programs, such as the STM32 Open Development Environment activity; X-Nucleo shields, STM32 Nucleo boards and support tools are part of these program, in which, ST-I is strongly involved on X-Nucleo proposition and development while ST-F, part of Microcontrollers Division(MCD), supports the proposition of STM32 micro and STM32 Nucleo & discovery boards.

A measurement of the success of our approach to the mass marketing, by providing support and tool on specific application, as in FED4SAE project, to favourite the adoption of our solutions and devices as enabler, can be found comparing the 2018 trend on shipments of X-Nucleo proposed by SRA (increased around 27% from around 15000 in 2017 up to 20000 in 2018) vs the total shipment that remained almost flat vs 2017. This confirm the interest on STM32 microcontroller as "core component" for wide range of application, especially, but not only, on IoT and CPS.



3.3.2 Update of individual exploitation plan

The initial exploitation plan remains unchanged, and on the positive results of the first year, the planned activities will be reinforced. In particular, most of the selected application experiments are based on STM32 and LORA thanks to the novel introduction of the STM Embedded Software for Enhanced LoRaWAN Experience. The usage of LORA enables ST to constantly expand its STM32 penetration in many IoT devices that require a low power consumption communication network.

Last but not least, dedicated pages inside ST web site and STM32 web community have been made available to promote Application Experiment results and third parties' competencies.

Another our common scope on FED4SAE is to perform all the actions that are needed to "sense" the weak signals from the field (disruptive tech, societal trends, technology evolution, market needs) to introduce them into our new plan.


For this scope, "weak signal sensing" activities like attendance at conferences, meeting with universities, R&D centres, and start-up and technology scouting activities in general are fundamental.

The project FED4SAE offers a landscape of SME trends and linked innovation capability, giving us an immediate feedback on our devices promotion and technology interest in areas.

A good indicator on interest in ST's products can be defined on the basis of the submitted proposals related to our platforms. More than 30 proposals are expected (Target) for ST, in particular more than 10 on each call (respectively more than 4 for ST-I and more 6 for ST-F in each call). The table below recaps these KPI.

Dissemination level: public (PU)

THIS DOCUMENT IS PUBLIC, AND WAS PRODUCED UNDER THE FED4SAE PROJECT (EC CONTRACT: 761708).

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Submitted proposals	Each Open Call (OC)				In all call in total	
	Target	I OC.	II OC	III OC	Target	Actual value
ST	> 10	14*	13	-	>30	27
ST-I	>= 4	7	5	-	>12	12
ST-F	>= 6	11	8	-	>18	19

(*) 5 common submissions

Another element of interest is related to the area coverage of the promotion, as expression of pervasiveness of the messages transmitted by FED4SAE promotion. For each call we expect submissions from at least 5 different nations, at least 3 for each of ST-I and ST-F.

Submitted proposals	Each Open Call (OC)			
	Target	1 st OC	2 nd OC	3 rd OC
ST	> 5 different nations	8 Nations France 2, Spain 2 Italy 4, Ireland 1 Poland 1, UK 3 Hungary 1	7 Nations Spain 3 Italy 3 UK 1, Hungary 2 Germany 2, Serbia 1 Norway 1	-
ST-I	>= 3 different nations	5 Nations France 2, Spain 2 Italy 1, Ireland 1 Poland 1	5 Nations Hungary 1, Germany 1 Spain 2, Serbia 1 Norway 1	-
ST-F	>= 3 different nations	5 Nations France 1 ,Spain 2 Italy 4 , UK 3 Hungary 1	5 Nations Spain 2, Italy 3 UK 1, Hungary 1 Germany 1	-


During the first two calls we received feedback from, in total, 10 different nations: France, Spain, Italy, Ireland, Poland, UK, Hungary, Germany, Serbia, and Norway.

ST is a provider of chip and solutions on base of their own manufacturing capability, and platforms, eval-discovery boards are provided and supported with development tools and packaged with the aim to facilitate the adoption of our device on third party/customers' new designs. Therefore the number of different kinds of products that has been in interest of third parties on the AE submitted are in our interest as feel of the market and feedback on our technical marketing activities.

For each call is expected that at least 5 different types of products will be involved in each call.









In both open calls we had at least the 9 following different types of device:

1. Power management ,
2. Bluetooth low energy,
3. Wi-Fi communication,
4. Lora communication,
5. Motion sensors,
6. Environmental sensors,
7. Time to Fly sensors,

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8. Low consumption Microcontroller (L family)
9. High performance Microcontroller (F family)

The table below lists the successful proposals for ST.

Funded AE	1	Funded AE	2	Funded AE	3	Funded AE	4	Funded AE	5	Funded AE	6	Funded AE	7	Funded AE	8
	AIRTECH	CADIX	HSENSE	MAMMUT	WEARTLS	HYPEMLIFE	OPTILIGHT	Specificity							
															
	AIR ANALITIC	WEGOTO	ENCORERELAB	ENERGICA	OMTLAB	GENPORT SRL	ALITEC SRL	HOP Ubiquitous							
	STM32	STM32F X-Nucleo extension board,	STM32 LORA SPV 1040	STM32 LORA	WeSu platform, STM32 Nucleo expansion board	STM32	STM32F	STM32F							
	SmartCity Santander testbed	CEA (SigmaFusion, Living-lab – mini smart village)	BME to assess the robustness of the solution.	Digital Catapult (LoRa™) testbed. CSEM LoRa geo- localization	BME Reliability testbed	ENERGY ELECTRONIC TESTBED - SMART LOCAL ENERGY SYSTEM FOR INDUSTRY	BME Reliability testbed	Corrosive Gases Testbed and Gas Sensor Testbed from Fraunhofer IISB							
	<i>smart rainwater management system.</i>	<i>Digital 3D city maps for different types of mobility and profiles</i>	Soil moisture CPS monitoring	<i>low-cost and high- frequency monitoring applications for stationary vehicles</i>	<i>integrate wearable electronics with kinetic and environmental sensors with UWB positioning system</i>	<i>embed a Li-Ion Battery I model into STM32 plat- form to provide info and Diagnostic</i>	<i>optimizing crop growth by information on the sunlight in green- houses controlling shading screens</i>	<i>air quality monitoring in Smart City market</i>							

3.4 Thales

3.4.1 Exploitation activities carried out in Year 1

The exploitation activities by Thales during Year 1 relies on the following pillars

- a- Increase the attractiveness of the Time4Sys platform by increasing features supported by Time4sys. The first objective of this strategy is to extend Time4sys to support the avionics standard ARINC653 in order to make it attractive for SMEs and up-to-date with respects to functionalities and applications in avionics.


- b- Raising awareness in the community

The second objective is to communicate on the Time4Sys platform. Hence, we have promoted the platform through various collaborative projects (ECSEL MegaM@RT2 and ECSEL AQUAS).

In addition, we promoted the Time4Sys platform in the international conference RTSS'18@work, with a presentation titled: "Time4Sys – Integrating Timing Verification in your Engineering Practices", as well as a poster and a demonstration.

Also, a presentation of the FED4SAE project has been done during the workshop DECPS'18 held in the ADA Europe conference at Lisbon, Portugal, on June, 22nd 2018 to encourage SMEs to submit proposals to FED4SAE and in particular for the Time4Sys Platform.

- c- Bilateral support of interested SMEs for proposal set-up

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Last but not least, an important activity is the bilateral support of interested SMEs for proposal set-up. Typically, we have closely worked with ARTAL technologies to target the Time4Sys platform with success. We have also visited the Linkconet Company in Tunisia to present the FED4SAE and brainstorm with them of possible innovative product for them based on the Time4sys platform.

Note that no application experiment has been granted during the first FED4SAE call for project, therefore no exploitation activities in terms of technical (co-) development with a SME could be performed. But fortunately, we got an application experiment granted in the second call of the project, so next year; there will be exploitation activities with ARTAL Technologies.

3.4.2 Update of individual exploitation plan

In the first call, we contacted companies and organisations which are connected to the timing verification domains or developing safety timing critical systems.


As a result of the first and second FED4SAE calls, there were (3 + 5) 8 applications for Time4Sys platforms with an application granted in the second call.

We have identified 2 kind of usage of the Time4Sys platform: Used in the design and Used in the product.

- Used in the design means that Time4Sys is used during the design and validation of the final product.
- Used in the product means that Time4Sys is a brick inside the final product and will be deploy by the company.

So some of the quantifiable exploitation goals of the programme are as follows –

No	Key Performance Indicator	Target	Exceeds	Outstanding
1	Leverage the FED4SAE Network to help raise awareness of Time4Sys. Reach communities that Thales may not reach.	Identify innovation clusters or communities, centres of excellence in Europe.	Reach Research Community and enable a relationship with a World Class European Centre of Excellence in CPS research & development.	New contributors to the Time4Sys platform or new supporter of Time4sys from new domain.
2	Applicants : Successful Ensure that there are minimum number (N ¹) of applications and that at least (N ²) Application Experiments are funded on the platform.	10 Proposals submitted which 3 were successful.	Collectively 12 Proposal Applications for Time4Sys	15 Proposal Applications for Time4Sys.
3	Innovative: Identify SMEs targeting using Time4Sys as a brick of the innovative product.	2 successful proposals that target innovative product totally based on Time4Sys –	1 innovative product totally based on Time4Sys that is	3 innovative products are good exemplars that distribute

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	That means the SME distributes the Time4Sys platform in some novel way – this could be targeting a new market or a different approach to an existing market. Ideally they should have some patents to protect their IP Innovation in the Time4Sys platform.	new markets or innovative usage of the platform	good exemplar that distribute Time4Sys and have a success starting story of the usage of Time4Sys	Time4Sys and have a success starting story of the usage of Time4Sys
4	Standardisation impact: While there is adoption of Time4Sys in various domains, there is an objective to make Time4Sys shared by the community and become a world class standard based technology. This will give long term guarantee of the investment efforts from SME.	Identify a standard body where concepts used in Time4Sys could influence standards. Define a roadmap to influence such standards.	Identify one standard, influence and evolve standard to embed Time4sys concepts. Some concepts of Time4Sys are defined in a world class standard.	The main concepts of Time4Sys become a world class standard (OMG, ISO ...)

While such quantifiable goals are important, obviously finding that one key disruptive company that revolutionises their industry and scale globally would really exceed all our expectations - be that in the development of Cyber Physical Systems (ARTAL Technologies), Assist architect to configure and validate complex operation System (FENTISS), etc.

3.5 AVL


3.5.1 Exploitation activities carried out in Year 1

The exploitation activities by AVL during Year 1 relies on the following pillars

- a- Increase attractiveness of AVL IODP by documentation of the platform and of its capabilities

The first cornerstone of this strategy is to provide and maintain an integrated and open development platform (IODP), which is attractive for the SMEs and up-to-date with respects to functionalities and application domain. Hence, the IODP, as data backbone and connectivity platform, has two main targets: (a) make the AVL tools and solutions available in a larger scale, and (b) enable the integration of third-parties tools. During the first year of FED4SAE, further white papers and training materials have been developed (see <https://www.avl.com/integrated-and-open-development-platform>) to help the SMEs to better understand the technology and develop relevant technical and business story lines.

- b- Raising awareness in the community

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The second cornerstone is to communicate on the platform. Hence, Innovation is tightly anchored in AVL's DNA, see Figure 1, with a high part of the turnover reinvested in R&D, large number of patents and high rate of skilled engineers and scientists. At the same time, the automotive industry is evolving fast and there is the need for partnerships in order to be able to evaluate the different raising technologies with limited budgets and efforts. Consequently, AVL has a network of technology champions in order to support the fast move to new technologies. At the same time, through the new automotive trends (electrification, autonomous driving, connected vehicles and diverse mobility), new skills and new actors are required. The FED4SAE community is very important to support the raise of the network toward digitalization. To support raising awareness, AVL participated to discussion on digital innovation hubs with the Austrian national funding agency (short before official project start of FED4SAE), and is distributing the call for paper to the Austrian national funding agency FFG as well a start-up incubators A plus B centers (<https://www.aplusb.biz/>) and to the Austrian funding agency AWS (<https://www.aws.at/>).



Figure 1: AVL overview


c- Bilateral support of interested SMEs for proposal set-up

Last but not least, an important activity is the bilateral support of interested SMEs for proposal set-up. Typically, multi-sided business models are targeted, which automatically lead to tight alignment both at the technical and business story line. In terms of technical story line, a detailed analysis of both portfolio and their complementarity is performed. In terms of business story line, common business models are developed in order to be able to address the customer in a more complete way.

Note that no application experiment has been granted during the first FED4SAE call for project, therefore no exploitation activities in terms of technical (co-) development with a SME could be performed.

3.5.2 Update of individual exploitation plan

Target for AVL exploitation is the capability to address customers with an innovative portfolio (first mover) providing value creation relying on cyber-physical systems solutions. Hence, it is unlikely that AVL will be able to explore all CPS-related technologies at the same time, and apply them to the AVL portfolio. The cooperation with SMEs enables to move in a much faster and more agile way, by gathering high skilled expertise for a co-development. Consequently, the following exploitation targets can be listed

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1- Through execution of the AEs, create new asset and follow-up business

The first target is related to the creation of a meaningful asset through successful AE executions. To achieve this target, tight collaboration already in the design phase of the AE is required to align on technical and business approach. During AE execution, again a tight degree of collaboration is required to fully understand the market addressed as well as the technical solutions already available, as well as the way to interact. Further, this activity should lead at the end by creation of common marketing documentation. FED4SAE is acting as facilitator and accelerator through the cascade funding and the access to the technical CPS related skills.

Minimum KPI: each AE led to a new asset (including marketing material) which can be used for customer discussion

Optimistic KPI: half of the AE is leading to new customer project no longer than two years after finalization of the AE

2- Increase the visibility of AVL and its portfolio for innovative SMEs

As discussed previously, a key aspect for AVL is to be attractive for innovative SMEs, who will enter discussion with AVL to conjointly develop new assets. The visibility and attractiveness is absolutely given for AVL core business (powertrain), however additional efforts is required for new technologies (e.g., digitalization, CPS). The FED4SAE project is a unique platform to increase visibility through (a) numerous dissemination activities, networking activities, strong web and digital media presence, (b) call for projects, and (c) creation of success stories through the AEs.

KPI: 20 new SMEs with CPS competences are aware of AVL, 5 SMEs are interested in direct cooperation and have entered detailed discussion to set-up a proposal


3.6 Digital Catapult

3.6.1 Exploitation activities carried out in Year 1

During the first year of the FED4SAE project, Digital Catapult has initiated exploitation in line with the objectives originally stated in the Initial Exploitation Plan. Specifically, Digital Catapult aimed to amplify ongoing activities of the Digital Catapult in the CPS/IoT sector, and to leverage the European dimension and complementary expertise of the project to maximise the impact generation in this domain in the UK.

Digital Catapult has worked towards the above objective through the following exploitation activities in Year 1 of the project:

- Introduction of the FED4SAE programme to the Things Connected programme and cohorts, at meetup events, via digital mailing lists, targeted phone calls, and in face-to-face conversations with startups. The aim of this activity was to enable the acceleration of more UK SMEs in the LPWAN space, by providing them with synergistic access to technical expertise, funding, and innovation support, through both FED4SAE and Digital Catapult programs.
- Detailed requirements scoping with two FED4SAE-funded organisations (UK-based Over the Air Analytics and Italian Energica Motors), and their relevant technical partners, to ensure the Digital Catapult LPWAN experimentation ecosystem adequately addresses the needs of startups and innovative companies in LPWAN. For example, this included scoping to expand the availability of a newer generation of LoRa base stations around London, which would enable more accurate geolocation of assets for innovators and users.
- Assessed and provided feedback on proposed LPWAN-enabled business solutions to startups applying to the FED4SAE programme in phone calls and three days of 30-minute 1-to-1s, to

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identify value add, strengths, and opportunities for improvement of proposed solutions. The aim of this activity was to better enable innovators to bring new disruptive CPS enabled business solutions to market.

- In cooperation with innovation management from Blumorpho, and testbed management by UNICAN, provide dFED4SAE startup Over the Air Analytics with guidance on business case, and considerations to enable market entry to other European countries, outside of the UK, enabling growth of CPS-enabled solutions on a European basis.
- Worked with Energica Motors and ST to create a plan to trial implementation of LPWAN technology in an established product within a midcap organisation, as a template for an implementation model for other UK-based midcap organisations.

With these activities, Digital Catapult is well on its way to establishing the new collaborations with Third parties, generating opportunities for UK business on a global and European market, and stimulating the adoption of new solutions within both the UK and Europe as a whole.

3.6.2 Update of individual exploitation plan

Digital Catapult's second year exploitation plans follow closely to those from year one. Digital Catapult's focus will remain on strengthening the UK digital sector by enabling win-win partnership for UK companies with other European players from the FED4SAE consortium.


Specifically, in year two Digital Catapult will focus on extending its support and:

- Providing insight and expertise on the entire CPS value chain, to ensure innovative companies understand elements for consideration to ensure scalability of their solutions;
- Facilitate education of corporates and startups around innovation management processes, when working with emerging technologies and players of different sizes along the value chain;
- Improve its capability to link local startups to funding opportunities, both from private clients through POCs and challenge-led activities, and through British or European investment opportunities;
- Promoting and de-risking investment into LPWAN technology through educational activities for larger corporates, technical support, and facilitation of conversation along the CPS supply chain for both startups and corporates via its newly opened Future Networks lab.

Digital Catapult will also promote its status as a fully-fledged Digital Innovation Hub. It is already registered on the EC portal (see <http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/1317/view>), and will promote its capabilities and services both to startups and midcaps looking to benefit from the DIG network, and as a consortium partner in future projects.

Specifically, this will involve promoting Digital Catapult's capability in:

- **Awareness creation** – through the hosting of quarterly Future Networks events for startups, larger corporates, and policymakers in the Future Networks lab, opening in February 2019. This will range from presentation of innovative solutions at meetup events, to intimate technology “101s”, introducing larger organisations to the benefits of CPS-enabled solutions in LPWAN, IoT and 5G.
- **Ecosystem building, scouting, brokerage and networking** – through continued outreach to LPWAN companies within the IoTUK communities (Mentor and Challenger Networks), members of the Things Connected network that have confirmed an interest in LoRaWAN, companies Digital Catapult has mapped in the Immersive space, who have sensor technologies compatible with LoRaWAN technology.
- **Collaborative research** – by applying for CR&D projects within the UK and Europe, both as a coordinator and participant, building on the DIH network established through FED4SAE

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- **Concept validation and prototyping** – with a minimum of two startups through FED4SAE, both from the UK and Italy, but assisting in design and deployment in the UK and Spain.
- **Testing and validation** – by applying the knowledge gained through FED4SAE experimentation, both first hand and through supported startups, to de-risk PoC testing and validation with at least one additional corporate
- **Incubation/acceleration support** – by widely promoting the final FED4SAE open call within Digital Catapult’s network of startups, to encourage maximum benefits from its support
- **Market intelligence** – through utilisation of public deliverables from the FED4SAE project to other Digital Catapult projects in the CPS and Future Networks domain, to allow companies to make informed investment and experimentation decisions based on up to date experimental and market data in the CPS and Future Networks domain, particularly around LPWAN technology.

3.7 Fraunhofer IISB

3.7.1 Exploitation activities carried out in Year 1

In line with the initially set out exploitation goals for the exploitation, during the first year, Fraunhofer IISB has promoted the project and its open calls among its network among Bavarian and German SMEs, for example through the regional initiative “Bayern Innovative” – an initiative of the state of Bavaria to support SMEs and midcaps to accelerate innovation and to help them turn their innovation into success.

The π -Fab infrastructure (continuous silicon CMOS and silicon carbide process line in an industry-compatible environment) with industry-oriented low-volume prototype fabrication of custom-tailored electron devices, with a focus on power devices, CMOS devices, passives, sensors, and MEMS was promoted to SMEs and their networks through the open calls.


Based on the experiences and learnings about the needs of the third parties (technology, innovation, etc.) made during the first year of the project (through phone and email conversations and personal contact to potential applicants), Fraunhofer IISB also has broadened its offerings in FED4SAE by introducing three new testbeds to the project:

- **Energy Electronic Testbed:** For the demonstration of sustainable energy generation, storage and supply in the range of small and medium sized industrial plants (decentral intelligent energy system) a decentral energy system at the Fraunhofer IISB was implemented. This available infrastructure can be used as testbed for various energy electronic applications.
- **Gas Sensor Testbed:** characterization of all type of gas sensors towards various target gases (e.g. volatile organic compounds – VOCs, etc.) in the relevant concentrations by using controlled gas mixtures at different temperature and humidity levels
- **Corrosive Gases Testbed:** To prove the resistance of materials and technical products to corrosive gases at exact dosages of the corrosive gases with a climate conditioned air volume.

These actions are fully in line with the set goal to improve the supplied technology and to develop required technology bricks in the future as set out in the initial exploitation plan and have led to several proposals for Application Experiments for these testbeds in the second open call.

In addition to the raised awareness and capabilities of the offered advanced technologies and testbeds, through the open calls in the first year, Fraunhofer IISB has created new collaboration and contacts with companies not worked before. IISB is supporting two companies in the second call:

- **Genport**, an Italian spin-off of Politecnico di Milano, developer and manufacturer of an advanced, lightweight technology for portable and stationary power generation and storage in medical, defense, emergency, telecommunication and industrial applications. GENPORT

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combines Proton Exchange Membrane Fuel Cell (PEMFC) and Ion Lithium technologies, in order to provide advance power solution to off-grid external equipment.

HOP Ubiquitous (HOPU), a Spanish company focused on research and development of networks protocols, security and Internet of Things solutions is specialized in scalable and advanced monitoring with different sensors combinations over our Smart Spot product line.

3.7.2 Update of individual exploitation plan

Fraunhofer IISB continues to aim at strengthened or new collaborations with third parties and through these targets the growth of awareness about its advanced technology and testbeds. The results and outcomes of the executed Application Experiments can serve as examples and showcases to support the promotion in the relevant networks. The support of third parties through Application Experiments (AEs) based on the industrial platforms as well as the advanced platform(s) of IISB will give valuable feedback about the offered technology bricks, enabling Fraunhofer IISB to further improve the advanced technology and testbeds.

Fraunhofer is further aiming to initiate collaboration with industry (Third parties, industrial partners) and academia in research and innovation projects to promote its experience in co-developing of CPS solutions and advanced technologies and testbeds and to use these to participate in applicable future programmes as follow-up to FED4SAE.

The awareness of the services will also enable IISB to initiate further bilateral collaboration with industry and SMEs.

Further, IISB will continue to promote FED4SAE instruments (technological, financial, innovation and business support) to regional stakeholders and funding authorities for local implementation of such activities.


3.8 fortiss

3.8.1 Exploitation activities carried out in Year 1

The primary focus area for fortiss within FED4SAE are adaptive production systems in the Smart Manufacturing domain, where we see the Industry 4.0 trend bringing new major challenges due to the increased introduction of software solutions into the automation industry. While new approaches to platform architectures promise better flexibility and adaptivity of production processes to increasingly frequently changing requirements and demands, companies, and SMEs in particular, struggle to keep up with newest developments. The main barriers for them are lack of knowledge in new technologies, and lack of resources to investigate, test, and deploy new solutions. In this context, fortiss addresses the main needs to enable SMEs

- To participate in new value chains to build adaptive production systems;
- To validate emerging technologies and standards for adaptive production systems and to suggest necessary extensions;
- To provide the relevant knowledge for using the technologies in new innovative products and services developments.

To improve adaptivity of automation solutions and overcome vendor lock-in, the fortiss DIH encourages the integration of open source platforms in the development process, and offers Eclipse **4diac**TM as a FED4SAE Advanced CPS Component. Eclipse **4diac**TM (<http://www.eclipse.org/4diac/>) is an open-source solution for programmable logic controllers (PLCs) of the next generation. It implements the IEC 61499 standard and therefore enables the development and management of platform-independent,

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distributed control applications in industrial automation as well as their real-time capable execution on any platform.

As laid out in the initial exploitation plan (deliverable D6.3), the main goals for fortiss are to further mature the Eclipse **4diac**TM open-source technology and grow its ecosystem of users, promote related new standards, and help stakeholders getting access to relevant further financing resources. During the first period of FED4SAE, we have been particularly tackling the technology maturation, and knowledge and awareness creation aspects. Specifically:

- Two new versions of Eclipse **4diac**TM (v1.9 and v1.10) have been released in 2018 (cf. https://www.eclipse.org/4diac/en_news.php).
- New capabilities of the 4diac technology have been showed in demonstrators presented at the *automatica* and the *CeBIT* trade fairs.
- Collaboration with industry and academic partners is further intensified through other projects, such as the nationally-funded *BaSys 4.0* project.
- Being part of the German Industry 4.0 competence centre network for SMEs, *Mittelstand 4.0*, allows fortiss to inform SMEs about new technologies and spread best practices. In this environment, fortiss has provided a specific training course on the new IEC 61499 standard that underlies 4diac.
- Interaction within the 4diac users and developer community has been further supported via the 4diac online user forum (at <http://eclipse.org/forums/eclipse.4diac>).


3.8.2 Update of individual exploitation plan

While the overall exploitation goals and the corresponding planned actions as described in the initial exploitation plan remain valid, fortiss acknowledges that the outcomes regarding new SME Application Experiments have been below our expectations so far, as we have not received any sufficiently high-quality experiment proposals during the first and second Open Call that addressed the 4diac technology. In order to counter this, and to broaden the field of applications that can potentially be addressed by interested SMEs in their Open Call proposals, fortiss has decided to add another Advanced CPS Technology to the FED4SAE portfolio, by offering the *Neural Network Dependability Kit* for use in Application Experiments proposed for the third and final Open Call:

- The **Neural Network Dependability Kit** is a toolbox for safety engineering of artificial neural networks and supports verification, test-case generation and metrics computation for such neural networks. Its key functionalities include a formal reasoning engine for ensuring that the generalization does not lead to undesired behaviours, novel dependability metrics for indicating sufficient elimination of uncertainties in the product life cycle, and runtime monitoring for reasoning whether a decision of a neural network in operation time is supported by prior similarities in the training data.

We expect that this additional Advanced CPS Technology connects well with the Industrial Platforms, particularly with the ones provided by Intel. Furthermore, this addition reflects the increasing attention that is drawn towards Artificial Intelligence in the development of smart CPS solutions, specifically also in the industrial automation domain. Similar to the activities around the 4diac technology, fortiss will carry out corresponding actions to enable SMEs to learn about, evaluate and eventually test and deploy new AI technologies, with the Neural Network Dependability Kit as a seed.

Extending the range of domains covered by fortiss to include Artificial Intelligence is also in line with newest developments in the local Munich ecosystem, where various players, both industrial and academic, start new AI initiatives and establish new centres for AI, such as the IBM Watson IoT Research Centre, the BMW competence centre for autonomous driving, the Munich School of Robotics

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and Machine Intelligence at TU Munich, or the appliedAI initiative by UnternehmerTUM. At fortiss, a new Bavarian Centre for Artificial Intelligence was opened in October 2018 (), which will both conduct research on AI and promote opportunities of AI solutions for SMEs. This new AI centre provides the foundation for a new Digital Innovation Hub on Applied AI, the “Munich Innovation Hub for Applied AI” (see <https://innohubai.fortiss.org> and <http://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool/-/dih/12409/view>), that was recently established at fortiss together with TU Munich and UnternehmerTUM.

fortiss will be leveraging this new DIH to drive further FED4SAE exploitation activities. We foresee the following set of DIH services to be offered to interested parties, with a particular emphasis on SMEs:

Access to Knowledge

This service category comprises activities for training, education and skills development, as well as raising awareness among technology firms about capabilities and benefits of the Advanced CPS Technologies offered by the fortiss DIH.

Activities: Organise information events, seminars, and training courses on the fortiss Advanced CPS Technologies. General events will be open to interested parties and free of charge; dedicated training can be designed for specific company needs where a course fee will be charged.

KPI: Number of companies participating in DIH knowledge-sharing events. **Target:** 30 per year.

Access to Technologies

The DIH provides access to the supported Advanced CPS Technologies via the Open Call Application Experiments, as well as through hands-on experience labs organised at the DIH using available demonstrators.

Activities: Run Application Experiments with third-party SMEs selected from Open Calls. Organise practical labs such as hackathons for the supported Advanced CPS Technologies to enable hands-on experience and prototyping of use cases.

KPI: Number of SMEs selected from Open Calls building innovative use cases exploiting the DIH-supported Advanced CPS Technologies. **Target:** 3

KPI: Number of industry participants in DIH technology events. **Target:** 10 per year.

Ecosystem Building


Ecosystem building activities aim at reaching out to all relevant stakeholders, primarily locally and regionally around the DIH, and utilise the connections to match needs and demands with offers and opportunities. This relates to both technology, e.g. connecting SME with a particular needs to solution providers, and training elements, as well as the funding side.

Activities: Establish or maintain online user fora around the DIH-supported technologies. Organise community events bringing together different stakeholders from industry, research, or finance. Organise ideation events, e.g. based on Design Thinking, to create novel use cases for CPS technologies and encourage follow-up collaboration of the participants.

KPI: Number of individuals actively engaged in the community. **Target:** 30-50 new per year.

Access to Funding

The DIH will offer services for companies to seek for appropriate funding opportunities for their product of service development projects. This will comprise both sharing information about different funding opportunities and promoting FED4SAE-like funding mechanisms to public authorities, as well as dedicated match making between companies and funding agencies or investors.

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Activities: Organise events to share information about possible public or private funding opportunities, available from both within the DIH region and nationally / internationally, e.g. in the FED4SAE DIH network. Promote SMEs who have successfully completed their Application Experiment to investors or potential customers at relevant events or fairs.

KPI: Number of companies successfully receiving new funding through DIH activities. **Target:** 1-3 per year.

3.9 CSEM

3.9.1 Exploitation activities carried out in Year 1

In the course of Call 2, CSEM contacted over two dozen SMEs from 10 different countries, helping to bring 39 proposals, 14 of which called for CSEM technologies and 3 of which have been retained for funding (i.e., MAMMUT with Energica in Italy, HyperCook with GreenTropism in France and SpectroX with Althexis Solutions in Cyprus).

Furthermore, CSEM is in the process of building a Swiss Digital Innovation Hub (DIH). The three press releases summarized below on the subject of *Digital Journey* attest to our plans, efforts and progress with respect to the realization of a Swiss DIH and our goal to help Swiss SMEs; building on and extending the FED4SAE concept, and reaching out to broad segment of Swiss SMEs:

- Neuchâtel, 28 June 2018. Get ready for your Digital Journey! – CSEM announced the Digital Journey, with the objective to facilitate the digital transition of the winning Swiss SMEs. The Digital Journey is competition that will enable the winning Swiss SME to benefit from technological support for their digital project; a value of CHF 100K offered by CSEM.
- Neuchâtel, 17 October 2018 - CSEM Digital Journey: seven SMEs in contention for a “boarding pass”, CSEM Digital Journey – Ready for take-off! – CSEM announced the seven finalists competing to win the 1st CSEM Digital Journey. Focused on CSEM technologies, this challenge intended for Swiss SMEs has generated considerable interest.
- 7 November 2018, A CONSORTIUM OF ZURICH SMES WINS THE 1ST CSEM DIGITAL JOURNEY, NEUCHÂTEL – CSEM announced the winner of the 1st Digital Journey completion, A CONSORTIUM OF ZURICH SMES. The companies Soleco, Vela Solaris and Geminise won the 1st CSEM Digital Journey, which was awarded at the annual Business Day of the Swiss R&D center. CSEM will make its digital expertise available to the winners to help them to develop their platform, which is designed to optimize the management of renewable energies in buildings.


Beyond the press releases, publicity was also made via our website, our Twitter account, and at conferences and events such as MEMS 2018, MNE 2018, IMCS 2018 and ETSI IoT Week 2018.

Additionally, CSEM has also endeavoured to broaden and extend our research collaborations in the domain of Digital Technologies, participating in several recent European and Swiss research initiatives.

3.9.2 Update of individual exploitation plan

In FED4SAE, CSEM offers technology services in three areas: Ultra-Low Power Integrated Systems, Advanced Manufacturing, packaging and MEMS and Surface Engineering.

ULTRA-LOW-POWER INTEGRATED SYSTEMS: The Ultra-Low Power (ULP) Integrated Systems program at CSEM addresses the challenges and technologies required to build very low power, typically wireless, embedded smart systems or remote sensing nodes. Such components are key to the realization of solutions for Internet of Things (IoT), wearable technologies for health and medical

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applications, as well as, machine-to-machine (M2M) communications required by Industry 4.0. CSEM activities span Vision Systems, Wireless Systems, RF IC design and System-on-Chip (SoC) design.

FED4SAE focus: *vision systems (Vision in a Package / Intelligent Camera, Intelligent Camera System for Hyperspectral Imaging), and wireless systems (WiseNET Ultra Low Power Wireless Sensor Network and WiseMAC protocol, GPS free localization solver for any LoRa® / LTE-M / NB-IoT / WiFi / BT Network and WiseDep Robust low power wireless for safety-critical applications).*

ADVANCED MANUFACTURING, PACKAGING AND MEMS: CSEM's Advanced Micro-Manufacturing activity aims to develop digital microfabrication technology—mainly based on 3D printing and additive manufacturing—specifically for microsystems applications.

FED4SAE focus: *Advanced Manufacturing & Packaging (additive manufacturing + microfabrication)*

SURFACE ENGINEERING: The Surface Engineering program at CSEM targets the control of surface structure and composition (both topographical and chemical) and the development of manufacturing technologies for industrial applications. It addresses such topics as the fabrication of nano-structured surfaces, the design and realization of nano-optical components based on nano-engineered surfaces, biochemical functionalized surface, flexible and broad material and process technology and the printing of components for fast and low-cost employment of flexible devices.

FED4SAE focus: *Nanotechnology for chemical sensing*

Exploitation goals

CSEM is at the heart of the digital innovation in Europe through the EPoSS membership, the HTA alliance, EARTO and the partnership in related projects (Gateone project, SMARTER-SI, etc...).

Our goals are to support start-ups and SMEs in their digitalization processes based on our FED4SAE focus areas: Advanced Manufacturing, packaging and MEMS, surface engineering and ultra-low power integrated systems technology platforms. More broadly, our goal (and mission) is to help Swiss and European companies in their innovation roadmap and consolidating our internal development by opening new possibilities of industrial collaboration; allowing CSEM to get closer to the industrial sector and reaching new potential partners. In-line with our mission and the goals above, the focus of CSEM's exploitation plans is on helping Swiss and European companies in their innovation roadmap and consolidating our internal development by opening new possibilities of industrial collaboration.

Towards this goal, CSEM seeks to build a network of stakeholders around the platforms and technologies supported by the different FED4SAE centres for their focused smart domains, to support establishing user-supplier relationships and to enable the exchange of learning assets (e.g. best practices). A central element in building such innovation eco-systems to achieve synergy will be to establish links between the FED4SAE centres and other existing regional and national innovation hubs.


Swiss DIH

CSEM is in the process of building a Swiss DIH (available technologies, Application Experiments, Engaging SMEs, Innovation Management, Access to Funding and leading the WP6.2).

As a Swiss DIH, and in accordance with our mission, we seek to support start-ups and SMEs in their digitalization processes based on our FED4SAE focus areas: Advanced Manufacturing, packaging and MEMS, surface engineering and ultra-low power integrated systems technology platforms.

Publicity

In-line with our mission, the focus of CSEM's exploitation plans is on helping Swiss and European companies in their innovation roadmap and consolidating our internal development by opening new

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possibilities of industrial collaboration. Additionally, CSEM has, and will continue, to make publicity about the FED4SAE at different events such as MEMS 2018, MNE 2018, IMCS 2018.

Digital technology services

Going forward, our target is to continue build on the momentum generated and to search for ways to exploit the results generated by the AE's retained in Call 2 as the results become available. For example, to offer our services as a technology provider to SME's requiring CSEM FED4SAE focus are technologies, such as GPS free localization and hyperspectral imaging.

3.10 KTH

3.10.1 Exploitation activities carried out in Year 1

Information regarding the FED4SAE Initiative and the Open Calls in particular have been exploited via the following means and channels;

1. The FED4SAE Initiative was presented during an Innovation Workshop for both Industry and Academia at KTH in October 2017 with approximately 40 participants.
2. The website of the KTH Digital Innovation Hub on Digital Industrialization.
<https://www.kth.se/itm/inst/mmk/forskning/mekatronik-och-inbyggda-styrssystem/the-iiot-hub>
3. By corporation with the Industry Network ICES that reaches almost 1500 people with their monthly newsletters. ices.kth.se
4. By Co-hosting 5 short seminars together with ICES with a total of 150 participants.
5. By corporation with the IOT Hub THINGS that interacts with a large number of member SME's as well as alumni's.
6. By co-organising a seminar at THINGS with 40 participants from both Industry and Academia in November 2018.
7. By informing the members of the Nordic IOT Initiative Hi2OT.
8. Connected the Startup GhostLabs with a potential Investor.
9. The AIDE Platform have been selected in one of the experiments during Call 2.

3.10.2 Update of individual exploitation plan

Role in the project: *Acting as competence centre and DIH*

Expected results: Support Third parties to integrate innovative technologies in their products and services.

Support Third parties in understanding innovation processes, and put them in contact with investors and business knowledge.


Exploitation strategy: Strengthen or create new collaborations with Third parties. Extend local ecosystem around testbeds and technology.

Benefits: Learning about innovative products and services by Third parties.

Learning about Startups, SMEs, and Midcaps business case constraints.

Growing Startups, SMEs and Midcaps to strengthen existing competence and business networks, especially in transportation.

Timescale: short medium and long term

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The KTH Digital Innovation HUB on Industrial Digitalization is having a number of activities in place for marketing its service offering towards Third Parties;

- Close cooperation with the Industrial Network ICES, with its 30+ members ranging from SMEs to large corps.
- Close cooperation with the industrial IOT HUB THINGS located in Stockholm
- Close cooperation with KTH Innovation, the local incubator for Students and Academics.
- The KTH DIHs will participate in a couple of larger seminars and public fairs together with the ICES network.

Example of activities for year 2;

- Information about the FED4SAE Calls and the DIH Services spread via the ICES monthly newsletter that reaches 1500+ industrial and academic reader.
- Information about FED4SAE Calls and the DIH Services spread via the THINGS newsletter to current members and alumni.
- Co-hosting monthly seminars with ICES on technical subjects.
- Participating at the ICES yearly Conference
- Part of other conferences together with ICES (In terms of availability)
- Co-hosting event together with THINGS and KTH innovation
- Involvement in the CPS Summer School for both Industry and Academia organised by KTH and Halmstad University

These are the KPI planned by the KTH DIH during Year 2 of the FED4SAE Project:

KPI	Minimum	Optimistic
No of clients introduced to the Prototype lab / Additive Manufacturing Test Bed.	10	20
No of clients introduced to the RCV testbed.	2	5
No of clients introduced to the AIDE Platform	3	5
No of clients that have received business coaching	5	7
No of clients (SMEs) to be introduced to the ICES network	10	20
Initiated cooperation with Innovation Centres / Science Parks / Business Accelerators	3	5

3.11 BME


3.11.1 Exploitation activities carried out in Year 1

1. Networking and coaching activities

During the FED4SAE project BME planned to become a Hungarian Digital Innovation Hub (DIH). We are not yet there but we think that we are on the right track in becoming one.

Dissemination level: public (PU)

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As a **CPS coaching and design house** BME has planned to exploit the results and experience gained during the EuroCPS and FED4SAE projects with **local SMEs**. It is expected that we will **support innovative 10-12 SMEs with coaching in addition** to the ones with IE support. This coaching is planned to be offered free of charge during the project and will then be offered for a consulting fee, or national support, depending on the availability of such.

First year networking activity: Different SME focussed events have been held in the first reporting period, like ICT program info-days, specific SAE info days and a meeting organized together with the Hungarian Agency for Innovation (NKFIH) to support and build longer term relations with the respective SMEs. 2 info days were held together with the NKFIH at the premises of NKFIH, and 3 consulting event were held for innovative SMEs at our own premises. In addition to this about 10 face to face meetings were held at BME for SMEs to orient them in writing SME Industrial Experiment applications targeting Fed4Sae SME support.

First year coaching activity: 1 transnational Industry Experiment has been selected for funding in the first Call for IE applications with BME coaching. The coaching activity was more difficult than expected as the person who was responsible for the project at the 3rd party has left the company after 3 month of working together and after a long vacuum in decision making at the 3rd party we had to start the coaching activity from nearly zero. Nevertheless, we expect that the experiment will be successful, even if with some time delays.

2. Teaching activities

Being an educational institute BME wishes to exploit the experiences in new university courses. The most important target of the new courses is the EU supported SSI+, our renewed **Erasmus + Master course** in Smart Systems Integration, which is teaching international master students. Additionally, a new **Summer School** program was planned to be developed for students to learn about how to design with European CPS platforms, based on experience of the SMEs and other case studies. A special direction of these courses is presenting the design methods and processes at innovative SMEs in the form of workshops lead by SME innovators. 26 students participated in the Summer School in the fall of 2017 and 18 more in 2018. At least 5 new fee paying students are planned a year who want to be specialized in CPS design, in addition to the 25 EU grant holders.

First year activity: A Summer School in Smart Systems Integration with 26 new participants was held in August 2018, where 3 half days were dedicated to smart systems design at SMEs. For these days 12 of our previous years students have also returned and participated at their own expenses.

3. Research activities

New research projects were planned to be created based on the new ideas and expert knowledge.

First year activity: an ECSEL project CPS4EU has been submitted for funding. The project is now in the negotiation phase.


3.11.2 Update of individual exploitation plan

Our exploitation plan for the 2nd and 3rd year of the project is not very different from the initial plan, but it contains some shift in the focus of the activities.

We will concentrate on developing all the missing expertise that is needed to become a national DIH, in addition to our successful transnational DIH activities.

- **Awareness creation**

We continue our activities by organizing local info-days for innovative SMEs at BME, and plan to participate in all the Hungarian national events, organised by NKFI.

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- **Ecosystem building, scouting, brokerage, networking**

Despite of the fact that we have exploited our capacity in coaching within the Fed4Sae project with 4 SMEs to coach, we continue our networking activity and help local and transnational SMEs to improve their Industrial Experiment applications. The SMEs with whom we get in contact will help not only in enlarging our ecosystem, but may serve as places to send our students to gain industrial experience as student interns.

- **Collaborative Research**

Our major goal is to develop special relationship with all the innovative SMEs with which we are in contact in order to initiate new research directions and new research projects with them. This activity was successful already in the past, and we expect that the SMEs we coach in the next years will become our research partners in the near future.

- **Testing and validation**

A special attractive force of BME as a coaching partner is the world class special knowledge that we have in testing and reliability assessment. In the first year of the Fed4sae project we have offered our novel Reliability testing facility for the Industrial Experiments, and this was so popular, that our capabilities are fully exploited already after the 2nd Call. The success of this service has encouraged us to enlarge further the services that we offer for SMEs in reliability testing of Smart Systems.

- **Education and skills development**

We plan new courses in the renewed SSS+ Erasmus mundus Joint International Master Program that will start for us in 2019. A special new element of the program is the strengthened industrial participation in the education, as we plan to send each student twice for internship during the 24 months Master Program. The innovative SMEs with whom we build special relationship within the Fed4Sae project will benefit from the special fresh knowledge of the very high quality international students (about 25 are selected out of roughly 800 applicants yearly), while the internship will provide excellent opportunities for the students to gain experience in working at innovative SMEs.

At the Summer Courses the best SME projects will be presented to the students.

3.12 University of Cantabria

3.12.1 Exploitation activities carried out in Year 1

During the first year UNICAN has carried out several activities related to the exploitation of the SmartSantander testbed within the FED4SAE framework. Such activities have followed the initial plan stated in the previous deliverable: actions to engage the community, support companies to carry out their developments on top of SmartSantander and the execution of Application Experiments.


We can highlight the following activities among them:

- **Ecosystem**

During the first year, the SmartSantander testbed DIH ecosystem has been turned into a fully operational Digital Hub.

- **Creation and participation on information events**

During the first year, we have participated in three different events related to the two first open calls. These events had a two-fold approach. First, to disseminate the open calls offered through FED4SAE to promote and support CPS developments. Second, the promotion of the

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SmartSantander testbed DIH, including the possibilities the testbed offers to companies related to CPS. The events are summarised in following:

Event Name	Type of event	Link or description
SynchroniCity Open Call Clinic - F2F - Santander (+ FED4SAE Open Call Information)	Face to face	Project open call presentation along with the municipality.
FED4SAE Open Call Information	Online	Spanish webinar
FED4SAE Open Call Information	Online	Spanish Webinar

The total number of attendants in the events aforementioned where 34. Detailed information about those events can be found in deliverable D6.6 about dissemination activities.

- **Promotion**

Thanks to the participation in FED4SAE we are increasing the awareness of the SmartSantander testbed among third parties in the European Union, which has led to an increment of queries to make use of the testbed within the project.


- **Participation in new AEs**

In collaboration with the municipality of Santander, we have started discussions with new companies to carry out AEs within the FED4SAE framework. From such discussions, one Application Experiment that use the SmartSantander testbed have been started. Additionally, we received a total of 5 proposals involving UNICAN in the first open call.

3.12.2 Update of individual exploitation plan

During the second and third years of FED4SAE project, UNICAN aims at continuing with the work carried out previously in order to foster the usage and the promotion of the IoT-SmartSantander DIH. As mentioned in D6.3, UNICAN will continue to develop and work on the following areas, where UNICAN has already a great expertise, to support third parties within SmartSantander:

- Protocols and architecture design and implementation for mobile communication networks.
- Context management and context-aware solutions from network to application level, through the implementation of different schemes, based on the provided information, to manage the access to the network.
- Middleware platforms for sensor networks and other mobile technologies, in order to uniform and homogenize the access to subjacent sensor technologies from the upper layers.
- Internet of Things, including deployment and installation issues, as well as the management of the whole network, the execution of different researching experiments and the provision of several services to the citizens.

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- Contactless communication technologies, such as RFID, NFC, MIFARE and its evolution DESFire, applied to smartcard solutions and NFC-based mobile environments.

In that sense, UNICAN, along with the Municipality of Santander, provides support with several services within the DIH activities. These services are not only offered under the framework of FED4SAE, but also in the context of other projects in which UNICAN is involved. A detailed description of these services, along with the expected outcomes and KPIs for them, are described below:

- **Ecosystem building, scouting, brokerage, networking; Awareness creation**

One of the most important activities within the IoT-SmartSantander DIH is the expansion of the existing ecosystem by leveraging the dissemination and exploitation activities carried out with the help of the municipality. In this sense, thanks to FED4SAE project, we will be able to access to a wider ecosystem of companies through the participation on the open calls and the collaboration within the chosen Application Experiments.

- **Education and skills development; Collaborative Research**

As University, one of the main goals for UNICAN is the increment of the scientific production of the institution with novel scientific papers, posters and conferences. Additionally, finding new funding sources to participate in collaborative research projects is also part of the UNICAN strategic goals.

These services are aligned with the goals from UNICAN. Therefore, FED4SAE will help UNICAN to find new interested companies to participate in future collaborative projects, as well as to find interested parties to perform collaborative scientific publications.

On the other hand, UNICAN has a great experience in the educational field. Thanks to the participation in FED4SAE, UNICAN will keep updating his current educational offer in the different subjects by introducing latest trends in research. Furthermore, UNICAN expects to play a great role by coaching third companies attending to FED4SAE calls in the areas where UNICAN already has a great expertise.

- **Concept validation and prototyping; Testing and validation**

As part of one of the specific characteristics of the SmartSantander testbed, UNICAN will seek to deploy new prototypes from companies within the testbed. Such prototypes will benefit of deploying in a real urban scenario to test its functionalities under real conditions. Additionally, thanks to the experience gathered while deploying infrastructure in the city, UNICAN will help companies on the development of prototypes for the deployment on these scenarios.


FED4SAE will help UNICAN to reach new companies and initiate collaboration under the framework of the Open Calls.

Taking into account the previous services offered by the IoT-SmartSantander DIH, the following KPIs have been defined to be met within the framework of FED4SAE:

KPI	Goal
Submission of new proposals for FED4SAE Open Calls in which UNICAN participates as Networking / Competence partner or Advanced platform	3 - 6
Collaboration with new companies in AEs within FED4SAE	1 - 2

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Bilateral meetings with companies interested in FED4SAE and the IoT-SmartSantander DIH	5 - 10
New online / physical events to promote FED4SAE and the IoT-SmartSantander DIH, as well as to initiate contacts with new companies	1 - 3
Initiate contacts with new regional, national or international entities to promote FED4SAE and the IoT-SmartSantander DIH	1 - 2
Attending events to promote the SmartSantander testbed and FED4SAE as one of the projects it is involved	1 - 3
UNICAN will participate in new scientific publications or initiate new collaborative research projects	1 - 3

3.13 BLUMORPHO

3.13.1 Exploitation activities carried out in Year 1

BLUMORPHO is promoting the value of CPS to investors with the promotion of the FED4SAE action. The INPHO venture summit was especially chosen to reach out a community of investors aware of the risk to support the development of hardware products. This action lead not only to the high visibility of the EU action to support SMEs but also raised the interest of CPS to a range of investors who decided to explore this area for 2019. The BOSCH Venture forum will explore not only the future of mobility but also the innovation associated with urban living (smart cities). The TRUMPF Venture Forum in 2019 will also cover the association of AI with CPS, but also Cybersecurity in CPS. Additional investment companies such as Brain to Venture and Supernova Invest are also interested to further discuss with us the investment opportunities in the industry segment. The company Alibaba Cloud also offered the possibility to meet with the FED4SAE supported companies to study with them the possibility of a free access to Cloud solutions.


The promotion of CPS to the Health Technology Assessment (HTA) European organisation lead to an agreement to review the projects supported in FED4SAE but also in other Smart Anything Everywhere areas.

In order to raise the awareness of the use of CPS to the industry, BLUMORPHO has promoted the FED4SAE calls towards clusters and published an article on the value of CPS, in the Europe Entreprise Network Newsletter (EEN).

3.13.2 Update of individual exploitation plan

Promoting CPS and Embedded Systems Innovation

In addition to facilitating access to funding and investor readiness training, BLUMORPHO is committed to promote the value of Cyber Physical Systems to investors. The investment companies involved need to be aware of the risks associated with the investments in hardware products. There is only a limited community of such investors, and the INPHO Venture summit was the perfect event to host sessions on this particular topic and have companies pitching in this area. This event is organised every 2 years in Bordeaux and took place in Oct 2018. BLUMORPHO was involved in the organisation which started as early as 2017.


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There was multiple outcome to this action.

1. Two companies involved in CPS projects have been invited to pitch during the event. The company GLANTA-SUREWASH, selected in the frame of the first call of FED4SAE, and Global Sensing Technology involved in EuroCPS have been able to present their investment opportunity to the panel of investors with an emphasis on the support received by the EC.
2. Two corporate investment organisations, BOSCH Venture and TRUMPF Venture have also adapted their research in investment opportunities opening the field of CPS.
3. The next BOSCH Venture forum will not only explore the future of mobility but also the innovation in the urban living. BLUMORPHO is partner of BOSCH Venture in the identification and selection of start-ups for a one-day event in 2019. The companies involved in FED4SAE have received the information about this call in priority.
4. The TRUMPF Venture team also organises an internal one day event inviting start-ups to pitch. The venture team decided to target more specifically companies developing CPS with a strong Artificial Intelligence background, considering that the combination of the two areas is generating far more value than CPS alone which is already well known by the Venture community. The companies offering Cybersecurity solutions to CPS will also be targeted. These 2 areas have become strategic for this particular call.
5. As an additional outcome of this action, the company Alibaba Cloud is interested to open discussion with any company with a need of Cloud Computing or Payment solutions. Depending on the field of activity and potential synergy with Alibaba Cloud strategy, the group can invest in a partnership in the form of a Voucher for a free access to Alibaba Cloud infrastructures. This opportunity will be offered to the interested companies in the frame of the WP5, during the exploitation plan activity.

BLUMORPHO also promoted the value of CPS for the medical sector to the Health Technology Assessment (HTA). “A health technology is defined as an intervention that may be used to promote health, to prevent, diagnose or treat acute or chronic disease, or for rehabilitation. Health technologies include pharmaceuticals, devices, procedures and organizational systems used in health care” (from <http://www.inahta.org/>) . Some demonstrators in FED4SAE are targeting the health segment (Glanta, Althexis). Thanks to the action of BLUMORPHO towards the HTA organization, it will be possible to receive a feedback on the social, economic, organizational and ethical issues associated with the potential innovation under development. We expect recommendation from the organization on how the development could be fine tuned to optimally prepare the market introduction according to the regulations. This is an additional DIH service that can be structured thanks to our network.

BLUMORPHO also promoted the CPS value through the communication to the organisations like EEN (Enterprise Europe Network) A short article was written by BLUMORPHO and published in the EEN September edition of the French Newsletter: *Adoptez les systèmes cyber-physiques et systèmes embarqués grâce au programme d'accélération FED4SAE*. (<http://www.een-topic.fr/actualite/140627-adoptez-les-systemes-cyber-physiques-et-systemes-embarques-grace-au-programme-d-acc>)

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4 Conclusions

The FED4SAE partners have carried out early exploitation activities during the first project year to build up, activate, and extent their local ecosystems around their CPS platforms and technology domains. The activities are based on the initially defined strategy to exploit the assets created by the project, viz. innovative prototypes for new CPS and embedded systems products and services resulting from application experiments with third parties, the communities and ecosystems around the FED4SAE DIHs, and the network of FED4SAE DIHs itself and the innovation services it can offer to European businesses. With initial experience gained from the first set of application experiments that have started during the first year, the FED4SAE partners have updated and refined their exploitation plans to progress further towards achieving the vision of a one-stop shop for innovation in CPS.