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Final Report on Dissemination & Exploitation Activities

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Abstract

This document describes the dissemination activities realized during the third year of the project, as well as the exploitation plans of all the EuroCPS partners. The consortium has continued to promote the EuroCPS initiatives by implementing strategies at both National and International level within the *Smart Anything Everywhere* initiative. To this purpose, the consortium leveraged multiple digital tools, such as an internet website and different social platforms, organized several events to promote the EuroCPS project, its objectives and its instruments, such as workshops, brokerage days, booths at conferences and fairs, etc.

Specific events to disseminate the results obtained by the funded experiments have been organized during the third year of the project. The document concludes with a short description of the strategies planned by the EuroCPS partners and the SME´s to exploit the results and the experience maturated during the project to further strengthen the links between the research and the industrial worlds in the field of IoT and CPS at European level.

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Introduction

This document is organized as follows. In Chapter 1 some statistics about the project website are provided for the whole project EuroCPS period as well as the usage of newsletters and other social platform to disseminate the most important information about EuroCPS. Chapter 2 describes the events in which the EuroCPS project has been promoted during the third year. To this purpose, all networking partners organized and/or participated in forums, fairs, workshops and other events related to IoT and CPS technologies, organizing booths and presentations to promote the EuroCPS approach, the project objectives and results within the Smart Anything Everywhere (SAE) initiative. For all the participated initiatives a detailed description is provided. In the following Chapter of the document, the current exploitation plan for all the EuroCPS partners is reported, highlighting how the experience maturated in the project, the creation of a European research-industry integrated network and the technical achievements of the project will be exploited by the consortium. The last Chapter is about the exploitation of the each individual SME who participated in EuroCPS where a consolidated summary of the SME exploitation is discussed.

1. Dissemination Activities

1.1. Project Website

The EuroCPS website has been designed and is operated by BME. It has become operational in the first month of the project, and it is continuously updated and upgraded to facilitate better dissemination, outreach and project operation. It includes a public part for public dissemination and a restricted part used only by the consortium partners.

It has some main functions:

(1) To inform SMEs, MidCaps about the EuroCPS project, the funding opportunities, the available CPS platforms and the coaching opportunities, the associated brokerage events.
(2) To facilitate the operation of the EuroCPS project and the collaboration between partners, to archive EuroCPS documents, by sharing project related restricted information among the partners,
(3) To enable the submission and evaluation of innovators projects of the Open Calls.
(4) To disseminate the results of the project, with special focus on the industrial experiments

The promotion of EuroCPS has been enhanced by promoting the selected projects, their objectives and expected outcomes and their realization.

The web address of the public website is https://www.eurocps.org/.

The number of visitors increased continuously during the first months of the project. It fell back after the deadline of the open calls. It shows a cycling nature with peaks around the Open Call dates.

The project has reached the expected reach of 800 SME target number already in the first year as already in the month of May 2015 the number of unique visitors has reached 800. So far the peak value was reached in the month of the 3rd open call: the number of visitors was around 2400. Since then the number of visits has decreased and has reached a steady 100 unique visitors weekly.

The figure below (Figure 1) shows the number of new visitors of the web site during the project lifetime. The graph clearly shows the peaks around the IE submission times, and the slowdown of the new visits after this period was over.
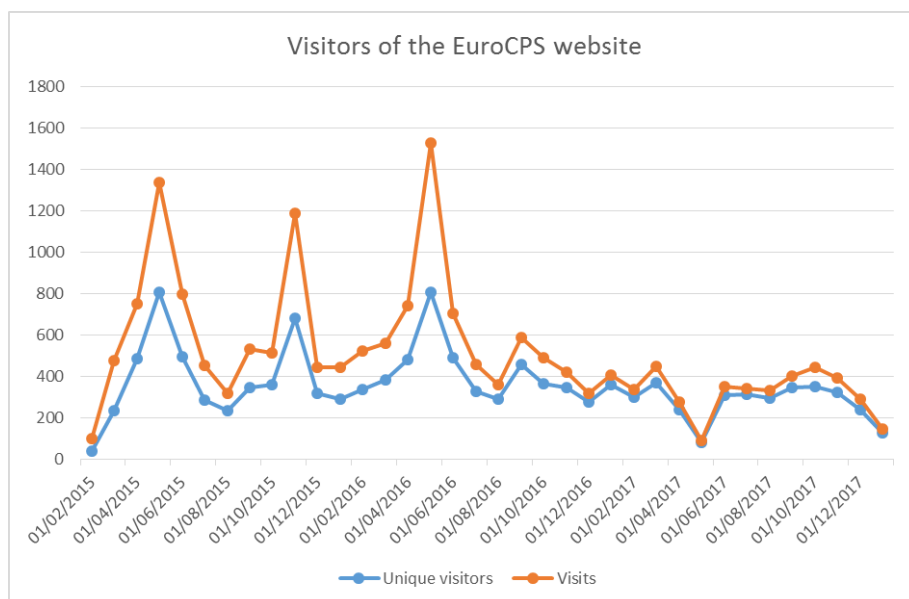
Figure 1: Number of new visitors of EuroCPS website – project timelife

The next graph (Figure 2) shows the total number of new visitors during the project lifetime. At the time of preparing this graph (15 January 2018) altogether 12839 different visitors visited the website at least once, and 18353 visitors have spent time on the website.
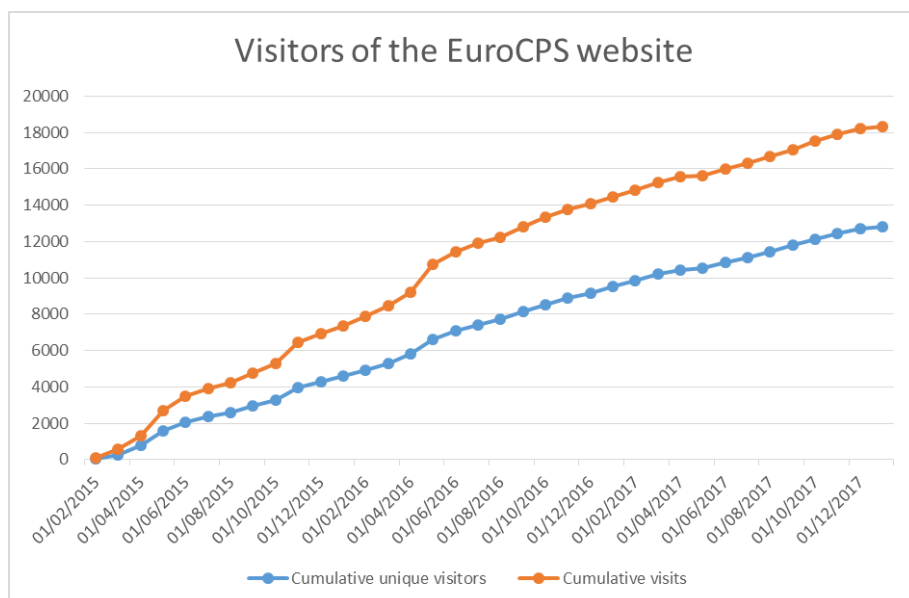
Figure 2: Total number of visitors of EuroCPS website – project timelife

Further detailed numbers about the web visits are available upon request.

2. Event Participation & Organization

During the third year of the project, the EuroCPS partners participated in several events to promote results of EuroCPS, to promote results of the individual experiments together with the SME and to strengthen the relation to the European network which was addressed during the open calls in order to have a sustain network after EuroCPS. Some events were organized by the consortium with the specific purpose of providing information about the project objectives and its approach, of consolidating the collaboration between competence centres, technology providers and SMEs across Europe. SME participated also on their own on specific events and exhibitions in order to exploit the results of their project to generate business.

Figure 3: *Geographical distribution of EuroCPS events in 2018 [yellow]*

STATISTICS SUMMARY	
Number of events - 3rd period	11
Number of events - total period	52
Total participants (events) – 3rd period	>900
Total participants (events) – total period	>1500
total visitors to the events / exhibitions – 3rd period	>400.000
Number of website visitors – 3rd period	> 4000
Number of website visitors – total period	> 18.000
Number of unique website visitors - 3rd period	> 2.500
Number of unique website visitors - total period	> 12.000

In the following, the main events in which the EuroCPS initiative was promoted during year 2018 (third year of the project) are reported, including some details concerning their scope and target audience.

2.1. "EFECS'17"

Conference & Exhibition	EFEC's 2017	Brussels (Belgium)
Organizer:	AENEAS, ARTEMIS-IA, EPoSS, ECSEL Joint Undertaking and the European Commission	
EuroCPS participants:	CEA	
Number of participants:	More than 500	
Link:	https://efecs.eu/	

Description

European Forum for Electronic Components and Systems

Dissemination level: Public document (Pu)

EFECS is the international forum with a focus on 'Our Digital Future' along the Electronic Components and Systems value chain in Europe. The organisers of this event, AENEAS, ARTEMIS-IA, EPoSS, ECSEL Joint Undertaking and the European Commission joined forces to bring all stakeholders together of 5-7 December 2017 and focus on 2017 year's theme: **'Our Digital Future'**.

Participation to EFECS gave the opportunity to Smart Anything Everywhere network (e.g. other projects granted under the SAE initiative), to exchange with other initiatives such as I4MS and between CSA projects. This was also the opportunity to promote FED4SAE towards the EC community.

2.2. *"Platforms4CPS workshop"*

Conference & Exhibition	Platforms4CPS workshop	Brussels (Belgium)
Organizer:	Platform4CPS projects	
EuroCPS participants:	CEA	
Number of participants:	30	
Link:	https://www.platforms4cps.eu/	

Description

CPS COMMUNITY ENHANCEMENT:

COLLABORATION & CONSENSUS BUILDING ALIGNED

ACROSS EUROPEAN POLICY AND PROJECTS

FACILITATED BY THE PLATFORMS4CPS PROJECT

INCREASING EUROPEAN TECHNOLOGY CAPABILITY
FOR SYSTEMS THAT CHANGE AND INTERACT WITH THE REAL WORLD

The workshop was set to set to consider enhancement to existing framework at both policy and project level enabling more effective collaboration on CPS. The objective of this interactive framework was to stimulate discussion on collaboration methods for CPS and improvement fields, alignment of the work performed in the different initiatives on results improvement paths (consensus to be reached), analysis of the supply and demand matching in order to see what would be the best way forward to promote the right innovation ecosystems and the constituency building to define the future of CPS with all the associated communities.

The workshop gathered partners from SAE initiative, Platforms4CPS project and various other EU projects such as ECSEL, EPoSS, ITEA, H2020, etc.

2.3. "DIF2017"

Conference & Exhibition	DIF2017 (Digital Innovation Forum)	Amsterdam (the Nederlands)
Organizer:	Artemis + EUREKA cluster ITEA	
EuroCPS participants:	CEA, 3 invited SMEs: GlobalSensing technologies, Terabee, Indeas&Motion	
Number of participants:	430	
Link:	https://dif2017.org/	

Description

The Digital Innovation Forum (DIF) is an international industry-driven event that focuses on Digital Innovation in Europe and beyond. DIF 2017 took place on 10 & 11 May 2017 in Amsterdam and welcomed the global software innovation community; large industry, SMEs, academics, start-ups, investors, representatives from funding agencies and public authorities.

CPSE Labs and EuroCPS collaborated to both have booths at the exhibition organized as part of the DIF 2017 by Artemis-IA and ITEA, Amsterdam, May 10-11, 2017. EuroCPS invited three of EuroCPS SMEs to present results from their industrial experiments: GlobalSensing, Terabee and Ideas & Motion promoted their project outcomes. If it was not the best opportunity to meet potential customers, DIF2017 offered the chance to promote SME's R&D activities together with active networking with other projects, various European initiatives, opportunities which were happily grabbed by the invited SMEs.

Figure 4: DIF 2017 – EuroCPS pod

2.4. *"Hannover Messe 2017"*

Conference & Exhibition	Hannover Messe 2017	Hannover (Germany)
Organizer:	I4MS SAE Ec booth orgainzed by I4MS	
EuroCPS participants:	2 invited SMEs: enfas, altreonic	
Number of participants:	200 000 visitors	
Link:	http://www.hannovermesse.de/home	

Description

The *Hannover Messe* **is** the world's leading trade fair for industrial technology.

SAE was present in the Group Pavilion of the I4MS at the German Hannover Messe, Hannover, April 24-28, 2017. SMEs participating in industrial experiments of EuroCPS, enfas and Altreonic, have presented showcases demonstrating results that benefited from EU support.
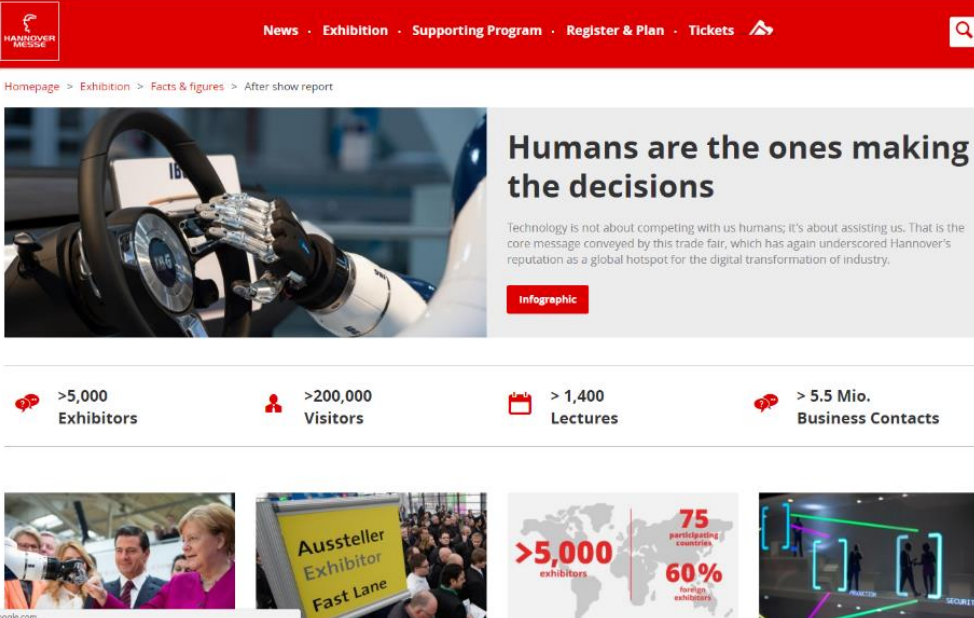
Figure 5: Hannover Messe 2017 – EuroCPS pods

2.5. *"Hannover Messe 2018"*

Conference & Exhibition	Hannover Messe 2018	Hannover (Germany)
Organizer:	I4MS + fortissimo team	
EuroCPS participants:	CEA, Fraunhofer, Digital Catapult, 2 invited SMEs: Wireless P2P, Hipperos	
Number of participants:	More than 200 000 visitors	
Link:	http://www.hannovermesse.de/home	

Description

EuroCPS was present at Hannover Messe 2018 promoting its success stories, with in particular the support of two SMEs: HIPPEROS and WP2P. It took also the opportunity to promote coming up open calls of the project FED4SAE. Active part was taken in the workshop organized by I4MS "Access to funding and competences for digital transformation of manufacturing SMEs". The event gave the opportunity for the SMEs to active networking on the Hannover Messe ground but also in the I4MS context having fruitful discussion with the other projects and SMEs attending the EC pavilion. This allowed also the EuroCPS representatives to share feedbacks, knowledge with the other attendees. It also gave the opportunity to meet one granted SME, GST, who was present under the FrenchFab pavilion (Hall 8).
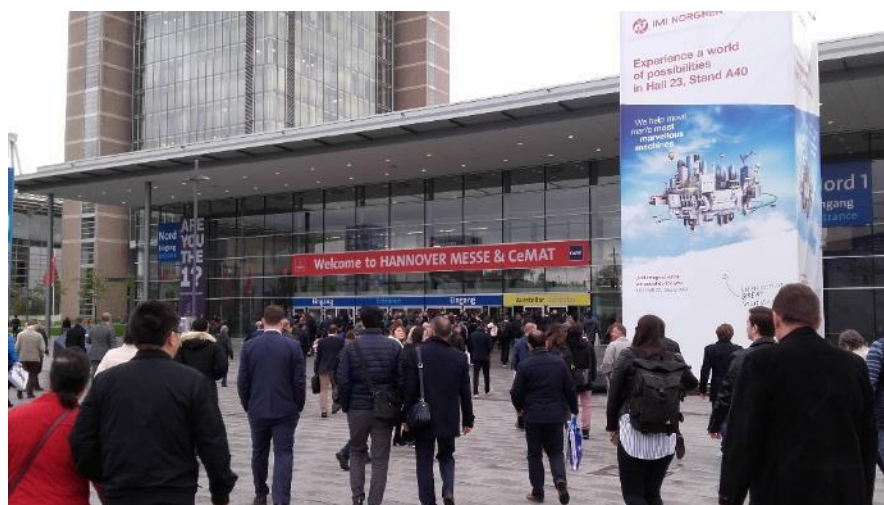
Figure 6: Hannover Messe 2018 – EuroCPS pods

2.6. "HIPEAC 2018"

Conference & Exhibition	HIPEAC 2018	Manchester (UK)
Organizer:	HiPEAC	
EuroCPS participants:	CEA,, Intel + 1 invited SME: NquiringMinds	
Number of participants:	530	
Link:	https://www.hipeac.net/2018/manchester/	

Description
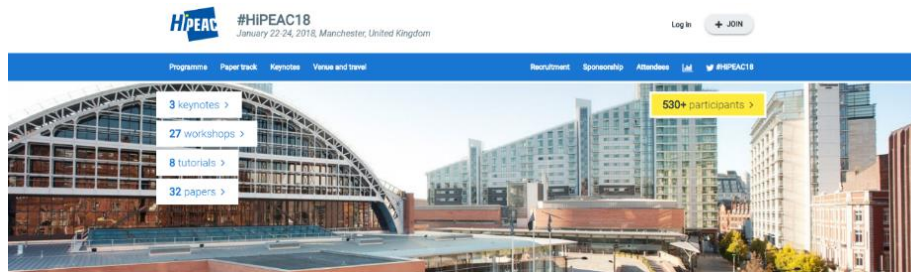
EuroCPS participated to the workshop organized by Tetramax "*On Transfer to Industry and Start-Ups*" bringing its expertise based on both EuroCPS and FED4SAE projects. EuroCPS organized the workshop entitled "*CPS success stories workshop*" that aimed at promoting success stories form different SAE projects (agenda in Figure 7.). It gave opportunities to share experience and feedbacks between SAE projects and also between granted SMEs, thus paving the way towards the building of the SAE community.

Figure 7: HIPEAC 2018 – „CPS success stories workshop" - Agenda

2.7. *"DiH Day"*

Conference & Exhibition	DiH Day	Madrid (Spain)
Organizer:	I4MS	
EuroCPS participants:	CEA	
Number of participants:	More than 280 participants	
Link:	http://i4ms.eu/new/Yna4vkrGK4iRPnrJh	

Description

The Digital Innovation Hubs' European event („*Key Towards broad digital transformation of European Industry*") took place in Madrid on the 22nd of September to showcase the achievements and next steps in the implementation of the pan-European network of Digital Innovation Hubs (DIHs), which is one of the key pillars of the Digitising European Industry Strategy. In particular, the event took stock of the European initiatives I4MS (ICT Innovation for Manufacturing SMEs) and SAE (Smart Anything Everywhere), which play a key role in the development of the network of DIHs. Different hubs and SMEs have presented their experiences and success stories, providing practical information on how to set up, reinforce and network DIHs. Building on this exchange of best practices and experiences, representatives from Member States, European initiatives and other relevant actors have also explored how to reinforce the network of DIHs beyond 2020. EuroCPS has participated to the workshop entitled „*Digital Innovation hubs: what are the achievements so far and what remains to be done?*" EuroCPS has discussed i) How is CEA (as a RTO) helping small companies open up new markets? What role does the hub play? and ii) Matchmaking SMEs with platform providers and competence centres is one of the key roles of project such as EuroCPS (for which you are a coordinator), what is the added value on this cooperation?

Figure 8: *DiH Day 2017 - „Digital Innovation hubs: what are the achievements so far and what remains to be done" worhshop -*

Dissemination level: Public document (Pu)

2.8. "Bootcamp"

Workshop	SME Bootcamp
Organizer:	Digital Catapult
EuroCPS participants:	All Consortium Partners
Number of participants:	5 EuroCPS SMEs • Exa-Informatics • HIPPEROS • Nestwave • TE Laboratories • Wireless P2P Technologies
Link:	See Annexes A - G for supporting documentation

Strategic Intent

The EuroCPS programme successfully engaged cohorts of Small & Medium-sized Enterprises (SMEs) to accelerate Cyber Physical System (CPS) technologies and applications through a programme of Industrial Experiments.

The objective of this Bootcamp was to deliver a tailored coaching event to assist in developing skills to help participating SMEs to scale their businesses and take their products/services to market.

Scoping

Scoping of the Bootcamp activity began on 4th – 5th July 2017 during the EuroCPS management meeting at the Infineon facility in Villach, Austria.

The EuroCPS consortium partners agreed that a suitable Bootcamp activity should provide business skills coaching tailored to the needs of the participating SMEs.

Further, it was identified by the consortium partners, based on their interaction with participating SMEs, that "*pitching*" (articulating business or product/service propositions to potential customers and investors) should be a particular area of focus. Accordingly, the Bootcamp should aim to improve the pitching skills of the SMEs and also provide them with content they could use to support engagements with potential customers and investors. It was decided that, a professional film of their pitch would constitute good takeaway for the SMEs from the Bootcamp.

It was also requested that a professional film be created at the Bootcamp to explain the purpose, scope and success of the EuroCPS programme.

Based on these decisions, Digital Catapult scoped a business coaching Bootcamp, including a notional agenda, delivery plan and costings [**Annex A**]**.** This was ratified by the EuroCPS consortium partners during a monthly conference call on 19th September 2017.

Delivery

In order to provide tailored coaching to the needs of the SMEs, Digital Catapult created a survey which was issued to the SMEs via the consortium partners [**Annex B**].This survey was designed to ascertain the current business phase, product development maturity and priorities of responding SMEs. The survey also sought to elicit an understanding of key areas the SMEs believed they would be benefit from coaching on.

Digital Catapult undertook an analysis of the survey responses [**Annex C**], which identified the following possible topics for Bootcamp coaching:

- Pitching ideas and concepts
- Value Proposition development
- Growing teams / attracting CPS technology expertise
- Go-to-market strategy development
- Best practice in exporting within the EU
- Effectively marketing products/services
- Accessing finance and capital

These topics were selected based on the current areas of business focus articulated by survey respondents and their responses to questions regarding current barriers and obstacles.

Based on the survey results, Digital Catapult launched a Call for applications from SMEs participating in the EuroCPS programme to attend the Bootcamp [**Annex D**] and a provisional agenda for the activity [**Annex E**]. The following SMEs applied to the Call and were subsequently selected to attend the Bootcamp:

- Exa-Informatics
- HIPPEROS
- Nestwave
- TE Laboratories
- Wireless P2P Technologies

During and following this SME Call period, Digital Catapult and the EuroCPS consortium partners also identified topic coaches and refined the final agenda accordingly. Final Bootcamp coaching topics and coaches were as follows:

- **Defining Value Propositions**
  David Boundy - Director IoT Innovation, Intel

- **Strategic Marketing**
  Chris Bignell - Director, XL Communications

- **Accessing Finance & Capital**
  Karen Amram - Head of European Affairs, CEA Technologies
  Ben McClure - UK Country Manager, European Venture Finance

- **Exporting Products & Services**
  James Bamford - Business Developer, EIT Digital

- **Growing & Scaling Teams**
  Tamara Medina Sapovalova - Founder, Sapovalova Coaching

Having confirmed the attending SMEs, coaching topics and coaches, a final agenda was issued to all participants [**Annex F**].

During the Bootcamp, SMEs received coaching in the topics identified and had professional pitches filmed. Also during the Bootcamp, the SMEs completed a short feedback form on their experience [**https://www.tfaforms.com/4654841**]. Results from this feedback form based in a response from 4/5 attending companies indicated that:

- 100% of attendees were either satisfied or very satisfied with their experience at the Bootcamp
- 75% of attendees have expanded their business acumen
- 75% of attendees believe the Bootcamp has impacted the work they will do in the future
- 100% of attendees found the presentations and coaching quite or very useful
- 75% of attendees found the pitch development and filming quite or very useful
- Key areas identified for focus beyond the Bootcamp for companies included:
  - Focusing on the customer requirements and how they will influence further development of existing and new products.
  - Market approach
  - Pitching skills

We further received comments regarding how this process could be improved in future, however the opinions from company to company did not give a clear overall view and simply articulated a personal opinion. One piece of feedback suggested a shorter time-frame while a second suggested a more focused pitch content session. Other positive comments suggested the session was 'perfect'.

Figure 9: Bootcamp event – Introduction session　　　**Figure 10: Bootcamp event – pitch session**

2.9. "PCIM"

Exhibitions	PCIM	Nürnberg
Organizer:	Finepower	
EuroCPS participants:	FPG / IFAT / SME´s	
Number of participants:	10	
Link:	https://pcim.mesago.com/events/en.html	

PCIM:

Finepower participated with its own booth at the PCIM in May 2018 which is one of the biggest exhibition for power electronics. We took this opportunity to have meetings with our SMEs in order to have status meetings and to align the industrial experiments.

On the other hand, there was the possibility to present results of EuroCPS to other networking partners who have been interested in EuroCPS which was the ECPE (European Center of Power Electronics) and the TNA (Technology Network Allgäu). This relations will sustain even after EuroCPS project where Finepower will actively continue to work as a competence partner within this network.

Hannover Fair:

Enfas as SME of Finepower participated at Hannover fair and demonstrated their potential product where the Ethercat- Interface was developed as an industrial experiment within EuroCPS. Beside the participation at the SAE booth enfas has also their own booth in order to promote their products further and to get potential customers for the storage device.

2.10. "Semicon Europa trade show"

Conference & Exhibition	Semicon Europa 2016	Grenoble
Organizer:	HTNL	
EuroCPS participants:	HTNL	
Number of participants:	The booth was visited by several hundreds of people	
Link:	http://www.semiconeuropa.org/	

During the Semicon Europa 2016 tradeshow, HTNL organized a joint Holland High Tech booth where companies can present themselves under the Dutch High Tech umbrella. During this exhibition the 3rd call for EuroCPS experiments was strongly promoted under the Dutch community as these shows are one of the most efficient ways to meet with the Dutch community.

2.11. "Semicon Europa trade show"

Conference & Exhibition	Semicon Europa 2017	Munich
Organizer:	HTNL	
EuroCPS participants:	HTNL, vanMierloo, Linqvision, Develab	
Number of participants:		
Link:	http://www.semiconeuropa.org/	

During the Semicon Europa 2017 tradeshow HTNL organized a joint Holland High Tech booth where companies can present themselves under the Dutch High Tech umbrella. During this exhibition the Dutch 3rd call EuroCPS experiments were presented to the audience. The three experiments draw quite some attention as did the mechanism of cascade funding that appealed to many SME companies visiting the booth.

2.12.   "Embedded Conference Scandinavia (ESC-2017)"

Workshop	November 7-8 2017	Kista, Sweden
Organizer:	Svensk Elektronik and Elektronik I Norden	
EuroCPS participants:	LTU, WP2P, Conex	
Number of participants:	1914 visitors, 90 exhibitors	
Link:	http://www.embeddedconference.se	

Description

As a main outreach activity for the EuroCPS undertaking, an invited talk was given. ECS is the main Scandinavian event in regards to the embedded industry with almost 2000 visitors, close to 100 exhibiting companies and more than 80 academic sessions.

Our presentation covered the EuroCPS initiative and underlying structure in general and projects with LTU as a supporting partner in particular. For the presentation two EuroCPS projects we covered in more detail "Self-organized Communication Network for Harsh Environments", WP2P AB (https://wp2p.org), and "Drone 3D Scanner for Underground Mines", CONEX AB (http://conex.se). Both companies had attending representatives, taking questions from the audience including the setup, execution and results of the EuroCPS participation.

Among the audience, we found main players such as ABB and SKF with an interest in the EuroCPS project from a cooperate perspective, as well as numerous SMEs in the field. The presentation led directly to interesting discussions in between the attendees and companies represented.

Besides the presentation, LTU arranged with a Booth in the exhibition area, where visitors could obtain leaflets and get additional information.

2.13.   "SiDO 2018"

Workshop	April 4-5, 2018	Lyon, France
Organizer:	SiDo	
EuroCPS participants:	1	
Number of participants:	6900 professionals, 350 exhibitors	
Link:	https://www.sido-event.com/en/	

Description

CONQUERING THE INTERNET OF THINGS

SIdO is the biggest international showroom dedicated entirely to the Internet of Things. It is free for professionals. 2 days of conferences, solutions, networking, showrooms and tech workshops to help you imagine tomorrow's use of the Internet of Things and reinvent your business models.

CEA arranged a booth to promote EuroCPS success stories and the Smart Anything Everywhere initiative.

3. Exploitation Plan

3.1. Overall Project Objectives

One of the central objectives of EuroCPS is to build on existing structures and links provided by partners, a European core of competence on Embedded systems and Cyber Physical Systems, for fostering innovation through SMEs. This will be achieved through tight integration between the partners and the SME's which will be selected during the timeframe of the project with the Cascade Funding scheme. .

EuroCPS grows a wide array of Industrial and SME partners with strong and high-level industry participation. Exploitation plans for the EuroCPS consortium are measured considering the number of international events organized and the capability to reach more third parties and to extend the ecosystem of SMEs which are excellent in embedded systems and CPS.

A lot of country specific consortia and organizations have been contacted during EuroCPS where connection between SME´s, platform provider and competence center have been new established or have been reinforced. The details are provided in the report for sustainability.

3.2. Individual Exploitation Strategy

3.2.1. COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES [CEA]

The CEA is the French Atomic Energy Commission (Commissariat à l'énergie atomique et aux énergies alternatives). The CEA is active in three main fields: energy, information and health technologies, defense and national security. In each of these fields, the CEA maintains a cross-

disciplinary culture of engineers and researchers, building on the synergies between fundamental and technological research. Within the CEA Technological Research Division, institutes lead research in order to increase the industrial competitiveness through technological innovation and transfers. The two institutes, CEA-Leti and CEA-List involved in EuroCPS project are focusing on many different applied research domains (RF, digital and SoC design for image processing, design environment and embedded software, wireless communication measurement, test and design…), developing advanced leading edge hardware and software technology solutions in particular for Cyber Physical Systems (CPS) and Internet of Things (IoT) systems.

EuroCPS goal for CEA is to support its mission to transfer its expertise and technologies to innovators to help them to prototype, test and grow their CPS ideas. Thus it is expected that EuroCPS will promote CEA expertise from silicon to system level and will increase SME engagement through collaboration programs such as joint laboratory. Also it is expected to evaluate the next technology R&D to engage for future market applications.

Seven industrial experiments involving CEA-Leti and CEA-List were granted by EuroCPS:

GOSPEL, NEUROCPS and uLPGPS are 3 industrial experiments focusing on the development of new components using the 28nm FD-SOI STMicroelectronics technology platform. This shows the attractiveness of such collaboration and funding model for integrated circuit design. For CEA-Leti, it provided the opportunity to transfer 10 years of experience and expertise to third parties to efficiently design new IC components in FD-SOI. On the other hand, the granted SMEs (*Apix*, *GlobalSensing Technologies* and *Nestwave*) had the possibility and support to investigate the benefit of such technology for their future product, while de-risking their development and make the right decision versus very costly developments. For STMicroelectronics, it enabled to attract new SMEs for manufacturing their product. As a results, the three granted experiments have permitted to draw the specifications and the requirements for the next generation of components using the 28nm FD-SOI technology. Feasibility studies were conducted and new component cost projections were evaluated taking into account the following steps: development/design costs, industrialization costs, the chip costs, etc.

- It allowed Apix to define a clearer roadmap for the new component describing resources (non-recurring engineering, NRE, and fabrication costs) and time requirements associated with the Apix's targeted production volumes. Then discussions must follow up with the industrial platforms. Additional activities with the CEA are foreseen through joint collaborations to upgrade Apix's new components as well.

- It made it possible for GlobalSensing technology (GST) to have access to cutting-edge technologies, to secured place to innovate and bring high-value products on the market, to get first estimation about the fabrication costs (being industrially viable).

- Collaborating with CEA has allowed Nestwave to optimize a novel 4G receiver conforming to Nestwave's specifications and constraints, the first phase of product development. The next phases of development, focusing on RF design to cover a large number of frequency bands and types of signals, including the GPS signal, and on GPS

and 4G baseband design and implementation, foresee discussion with both CEA and ST for further collaboration.

MGIoT industrial experiment allowed *Greenwaves Technologies* to reach a major breakthrough in their technology maturity gain. It enabled to validate their GreenOFDM algorithm in a radio communication environment. It also enabled to build a hardware platform used to prototype connected device application using the proposed modulation. Indeed, thanks to a production cost less than 200 €, the achieved prototype enables a diffusion of the Greenwaves technology to the prospects willing to assess the capacity of the technology at a reasonable cost. In addition and foreseen as next step in their industrialisation plan, the industrial experiment allows Greenwaves Technologies to select an architecture for the integrated circuit that will embed this algorithm. The integrated circuit architecture provides a breakthrough in terms of energy efficiency, with a 10x improvement versus the state-of-the-art. The integrated circuit will be manufactured by a semiconductor foundry. This development is already partially supported by the H2020 SME Instrument phase 2 grant. The company is in the process of raising a seed round of 2M€. From customer aspects, the industry players that will select GreenOFDM are LPWAN solution providers and IoT operators. Greenwaves Technologies is engaged in discussion with several of those players. In terms of dissemination, Greenwaves Technologies has produced white papers on the technology, video tutorials, and attend industry trade fairs. CEA-Leti is making a video of this demonstrator that will be shown on the 23rd of March at the Digital day as part of the official celebration of the 60th anniversary of the signature of the Treaty of Rome. For STMicroelectronics, this experiments enlarged the number of users of the Nucleo platform thanks to the diffusion of the technology to the Greenwaves prospects. For CEA-Leti it enables to get a better understanding of the LoRA protocol and OFDM technology optimisation.

CNODE industrial experiment allowed *Encore Lab* to develop a simple low-cost, low-power sensing nodes based on the STM32 industrial platform and using only a few sensors to control the most changeable parameters: air temperature, humidity and soil moisture at three different depths. These nodes send data directly to the server using Sigfox communications. Encore Lab came to CEA-Leti to get the expertise on low-power system design and SigFox usage. CEA-Leti provided state-of-the-art and advanced technical solutions (TRL4-5) to help Encore Lab to evaluate the possible design opportunities and solutions for their product development. In addition, CEA-Leti developed a demonstrator relying on CEA Foxy device (a low-power SigFox transceiver) in order to reduce the energy consumed by the radio module of each sensor node. This collaborative work was helpful for Encore Lab to get an early access to the performances of an advanced radio system. The demonstrator was valorized at the ISSCC conference (Feb. 2017). CEA-Leti and Encore Lab had fruitful exchanges about technology use cases. CEA-Leti had the opportunity to evaluate the interest of its most advanced solutions (ex: Wake-up radio) versus industrial needs.

WOA industrial experiment has opened to *Terabee* the route for low-cost and reliable solutions for indoor localization and mapping by combining Terabee Teraranger modules with industry standard Inertial Motion Unit (IMU). Based on the results of WOA, Terabee is going to develop an updated HW-SW solution and then market the solution to its customers. In this framework, Terabee plans to set up the manufacturing supply and manufacturing chain to serve its markets. Beside, Terabee intends to continue working with CEA-Leti to further develop and enrich its technology in particular towards 3D map. For the

selected IMU platform it opens a new market access. Feedbacks on the I-NEMO platform should help ST-I to improve the drift of their sensors.

WEETSY2 industrial experiment is allowing *SuriCog* to develop a head mounted prototype as an add-on module to the existing SuriCog eye-tracking glasses. The 3D printed prototype combines both an embedded camera with a ST iNEMO IMU for fast tracking. The processing is based on a head localization software pipeline developed by the CEA-List. Currently the head localization software is executable through a PC. Once the industrial experiment is completed, it will enable SuriCog to validate the concept. More details will be disclosed into the next deliverable on exploitation. For the exploitation towards customers the software has to be embedded. Future collaboration between SuriCog and CEA-List were foreseen, a RAPID project and a joint lab. This objectives of the collaboration were aiming at embedding all processing on the glasses to further reduce the bulkiness and power consumption of the prototype, thus enabling further portability. But the perspectives of collaboration with Suricog (RAPID and joint lab collaboration) did not take shape as expected in 2018. There has been a certain turn-over among Suricog technical leaders. The company has focused on the consolidation of its know-how towards/regarding less ambitious products. Therefore R&D programs have been delayed. Technical discussions are continuing but no follow-up is expected before 2019.

In a global manner, the industrial experiments show a win-win situation where the SMEs, the CEA and the industrial platform provider can generate new business conjointly. SMEs are the best indicator regarding the evolution of the market and the future technology needs. It allows the CEA to track promising ideas, technologies and market trends in order to develop the technologies of tomorrow. On the other hand, SMEs can develop and validate innovative technology solutions thanks to the CEA expertise and industrial partner leading edge technologies, including silicon capabilities. For technology platform providers, it opens the door for new product to manufacture.

3.2.2. STMICROELECTRONICS GRENOBLE 2 SAS [ST-F]

Currently ST is one of the world leader for both standard and secure MCU's, supplying IoT market with both MCU as well as solid ecosystem for easy application development
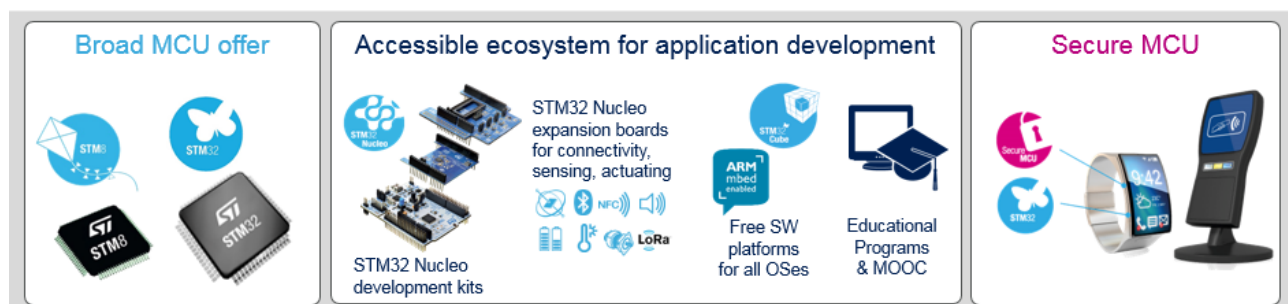
ST has a role in the project and in the setup of this IoT eco-system. Thanks to this project ST continues to expand its activity in the IoT market with its family of micro-processors, sensors and connectivity solutions, which can be used to assemble Intelligent Connected Devices. ST will further enlarge the IoT business in Europe by giving access to an IoT development

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environment enabling end-customers to reduce time-to-market for the development of secured, low-power, low-cost Intelligent Connected Devices.

For ST, the strategy is still the same, meaning a continuous expansion in the mass market domain. This expansion is supported by a large number of initiatives and a strong community. EuroCPS is one of the tool contributing to this expansion in bringing new applications to the STM32 platform.

3.2.3. THALES SA [THALES]

Target markets of Thales:

Thales is a global technology leader for the Defense, Security, Aerospace and Transportation markets. The company provides products covering a large panel of software, middleware and/or hardware solutions for these markets. In order to improve its competitiveness, the intention of the company is to push the adoption of safe & secure innovative solutions towards its six Global Business Units, and exploit the results internally. The potential impact of the EuroCPS experiments in the embedded system domain is high. Globally the embedded-software market is worth about 160 billion Euros, with an annual growth rate of 9 percent [Ebert and Jones. Embedded Software: Facts, Figures, and Future. Computer (2009) vol. 42 (4) pp. 42- 52.]. Overall, the European region is expected to generate more revenues in comparison to any other region because of its early technological acceptance and government regulations.

From a design and implementation perspective, the use of hypervisors and real-time QoS management addressed in EuroCPS industrial experiments is of interest for all business units of Thales even if the main impact of the EUROCPS for Thales is expected in its avionics and space business units. The space and aerospace application domains have very high safety requirements. So, the use of solutions to deal with space and time segregation is of high interest.

The European aerospace industry is a key sector for Europe with a contribution to the EU GNP estimated to about EUR 500 billion [ECORYS, "Competitiveness of the EU Aerospace Industry with focus on: Aeronautics Industry", 2009]. In this context, the avionics market is of special importance since in avionics domain Europe cannot depend from other regions. Avionics systems now represent 11% of aircraft value in average [Clearwater corporate finance llp, Aerospace Global Report 2011, 2010]. The avionics market is estimated at $8~9 billion per year and is expected to grow at a rate of 4.8% through 2019 [Avascent Analytics, "Avascent Analytics Projects $21B Commercial Avionics Market to grow 4.8% through 2019", September 2014. Available at: https://www.avascent.com/blog/2014/09/04/avascent-analytics-projects-21b-commercial-avionics-market-grow-4-8-2019/]. Figure 11 represents the market forecast by product [Aviation Week & Space Technology, "Global Commercial Avionics Market Forecast by Product". Source: Avascent Analytics. Available at: http://aviationweek.com/%5Bprimary-term%5D/global-commercial-avionics-market-forecast-product].
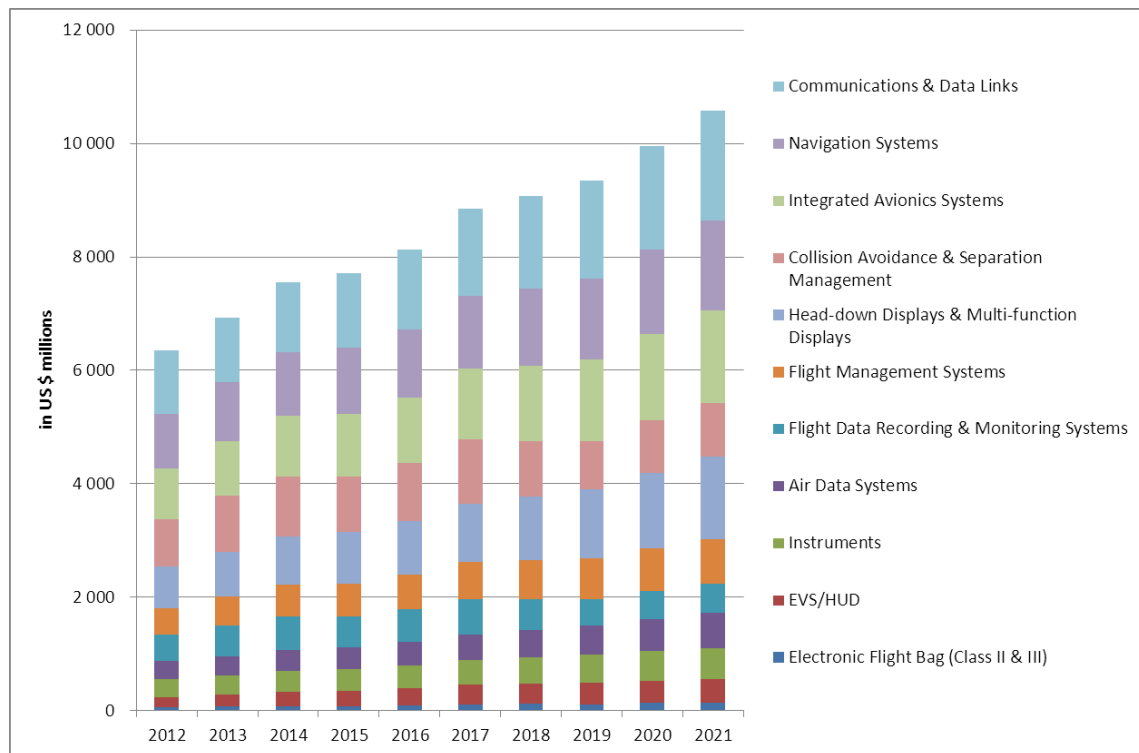
Figure 11: Global commercial avionics market forecast by product [Aviation Week & Space Technology, "Global Commercial Avionics Market Forecast by Product". Source: Avascent Analytics]

Today, in the avionic business, Thales, Rockwell Collins and Honeywell control 80 percent of the forward-fit market. In this portion, Thales' market share continues to rise [G2 Solutions, Commercial Avionics Market Analysis and Forecast, Air Transport Markets, 2007]. Figure 12 shows the position of Thales in the avionics market.
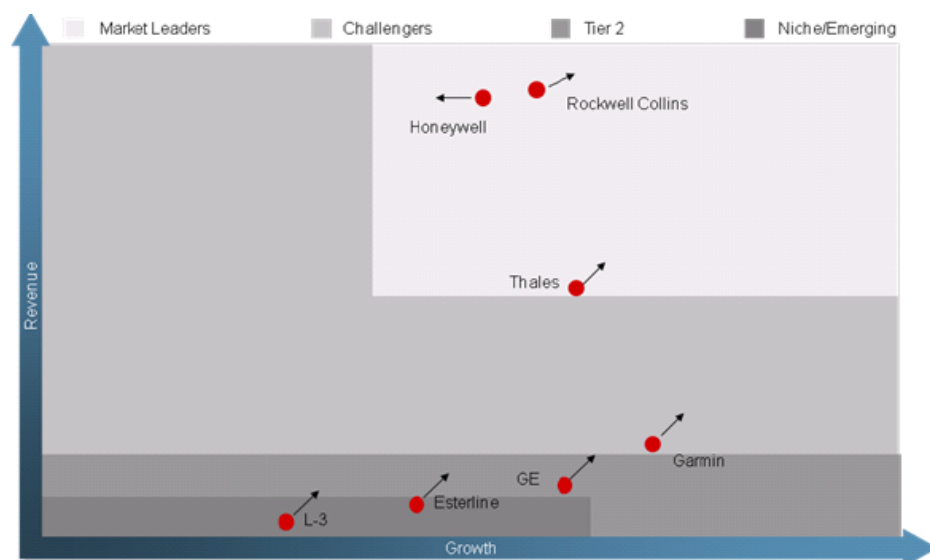
Figure 12: Global avionics competitive landscape [Frost & Sullivan, "Growth Prospects in Commercial Avionics Markets", May 2011]

The space industry is also a strategic sector for Europe. Over the last decade, 80 satellites were launched on average per year while 100 satellites were launched in 2011 for the first time in 25 years [Euroconsult, Satellites to be Built & Launched by 2021: World Market Survey 15th Edition]. Figure 13 shows the growth of the satellite market between 2008 and 2013. The market should continue to grow and a total of 1075 launched satellites should be reached over 2012-2021. The derived revenues should grow by 36% in the decade, and reach $198 billion over the period [Euroconsult, Satellites to be Built & Launched by 2021: World Market Survey 15th Edition].
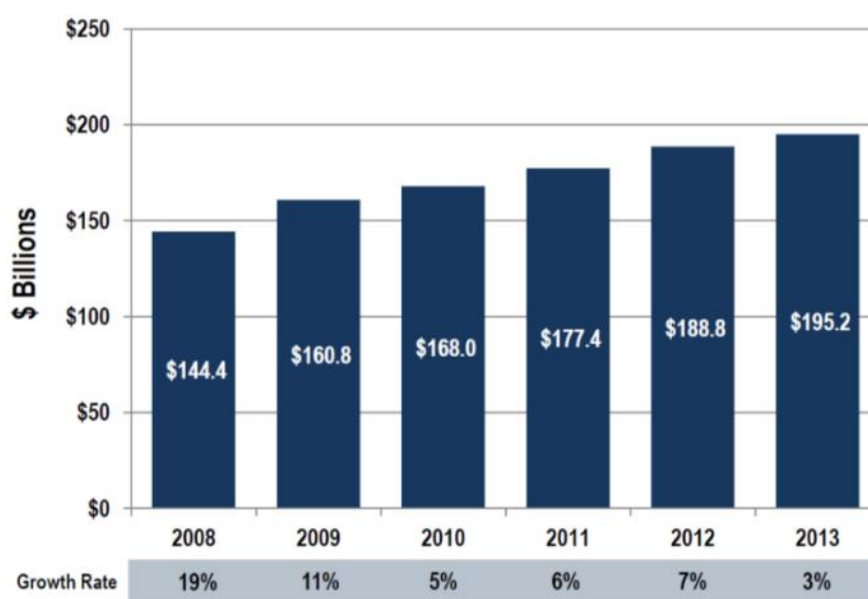

Figure 13: Global satellite industry revenues in US $ billions [Satellite Industry Association, "State of the Satellite Industry Report", September 2014]

A major part of the launched satellites is for telecommunication applications (see Figure 14) where Thales gets a significant share of the market. Thales Alenia Space is the global leader in telecommunications satellite constellations in low and medium Earth orbit.

Number of Spacecraft Launched by Mission Type (2013)

Value of Spacecraft Launched by Mission Type (2013)
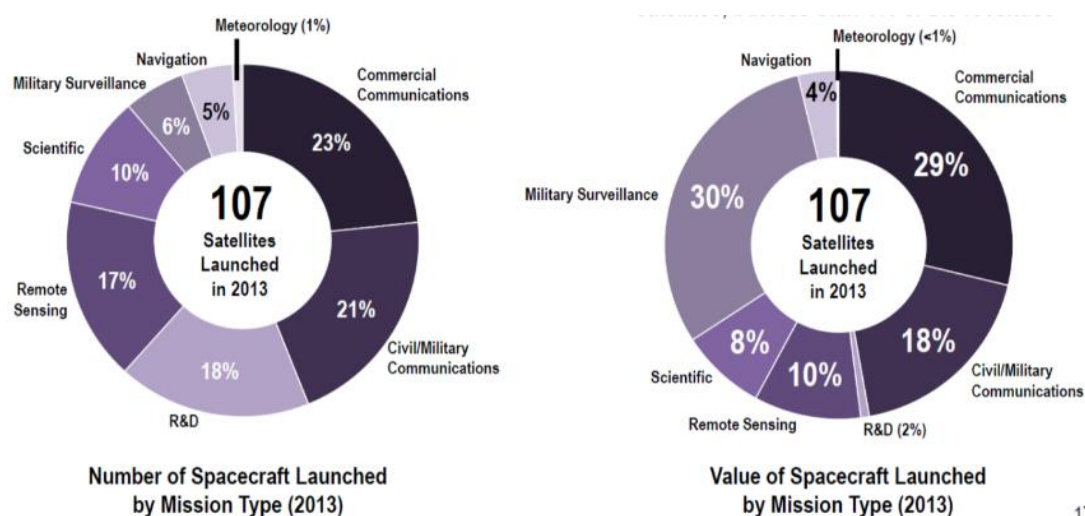
Figure 14: Satellites launched by function in 2013 Satellite Industry Association, "State of the Satellite Industry Report", September 2014

Figure 15 shows the position of the different actors in the space sector.
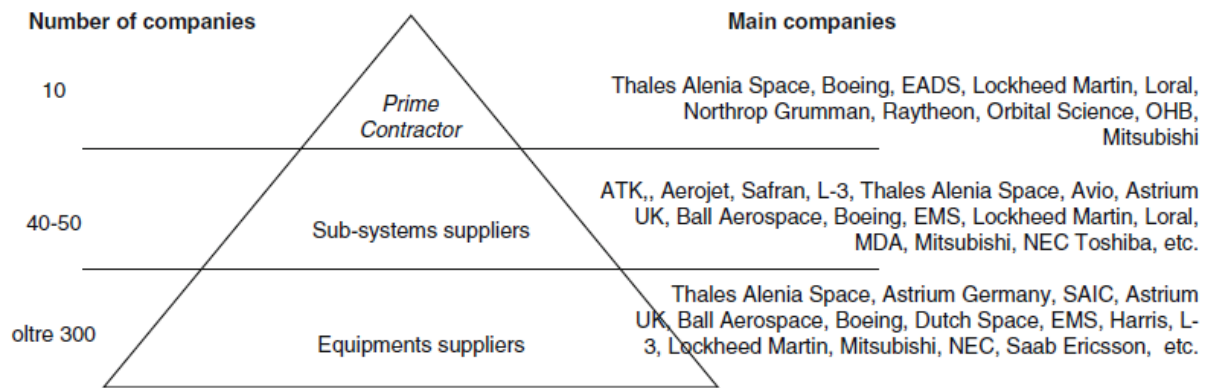
Figure 15: The industrial pyramid in the space manufacturing sector [M. Spagnulo, R. Fleeter, M. Balduccini, F. Nasini, "Space Activities: A Peculiar Economical, Political, and Industrial Sector", in Space Program Management, Springer New York, 2013, pp. 1-58]

Beside the aerospace and space markets, Thales targets also others market segments. The railway management system market, in which Thales is present, is notably estimated to grow from $19.58 billion in 2014 to $35.99 billion in 2019, at a Compound Annual Growth Rate of 12.9% during the forecast period of 2014-2019 [MarketsandMarkets, "Railway Management System Market (Operations Management, Intelligent Signaling, Traffic Analytics, Asset Management, Control Systems, Maintenance Management, System Integration, Cloud Hosting) - Worldwide Market Forecasts and Analysis (2014-2019)", April 2014]. Thales is a global leader in the supply of rail control systems and services including signaling, communications, supervision and fare collection systems. Thales's transport activity generates €1.5 billion in revenue.

Challenges and opportunities:

Today, many industrial fields in the area of information technology are facing the problem of increasing data-handling volumes and software complexity. This is a major concern in particular for the complex real time systems deployed in the space and avionics sectors (e.g., navigation systems). In the case of avionics, for example, each generation of embedded systems is implemented with an increased software size and a higher amount of software code to be certified, e.g., increased from 12 Mbytes in A340 to 80 Mbytes in A380 (Figure 16). Figure 17 shows that the size of the software has also increased exponentially in space missions during the last decades.

Figure 16: Increasing trend of software code in Airbus aircrafts [G. Edelin. Embedded Systems at THALES: the Artemis challenges for an industrial group. In ARTIST Summer School in Europe, 2009]
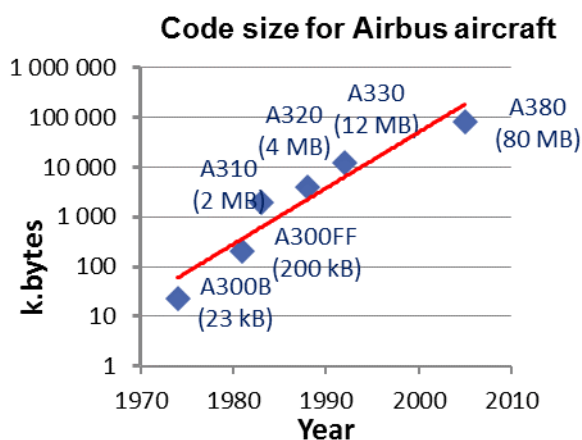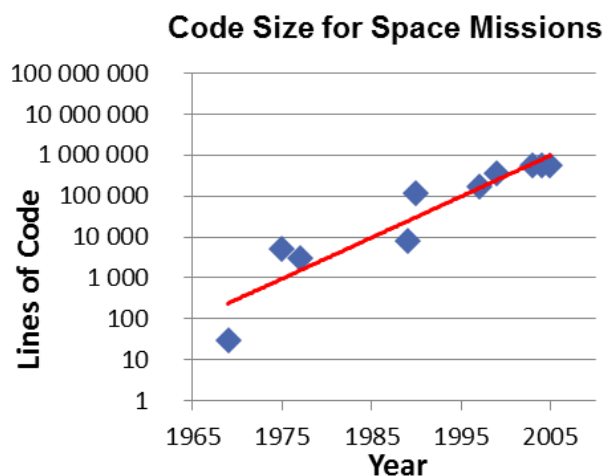
Figure 17: Estimated growth of on-board code size in space mission [NASA, "NASA Study on Flight Software Complexity", March 2009]

This increasing complexity is fueled by the increasing computing power of processors and the continuous technology scaling. To address the safety challenge, the EuroCPS Industrial Experiments are very important for Thales and will enable the development of higher performance safety critical embedded systems.

The set of complementary solutions to address safety issues at control software levels (hypervisors, run-time QoS management) is a strong element to raise the interest of business units, especially in the avionic domain. It will open new perspectives in Thales for the development of innovative products with added value for the aerospace, space and railways sectors.

Impacts on the avionics sector

Aviation innovation in Europe is driven by a global strategy defined at the European level [European Commission, "Flightpath 2050 Europe's Vision for Aviation - Report of the High Level Group on Aviation Research", 2011] promoting a safe and energy efficient aviation. Among the disruptive technologies required to master the environmental footprint of the air transport, innovative avionics systems will play a key role. For instance, the evolution to advanced Air Traffic Management systems based on exchange of flight intent information, real-time flight data, weather and other information between ground and airborne computers will enable to optimize aircraft trajectories and to avoid air traffic system overloads [European Organisation For The Safety of Air Navigation, "Study Report On Avionics Systems For The Time Frame 2007, 2011 AND 2020", November 2004.]. But future generation of navigation systems in aircrafts, new cockpit generations that are safer, simpler [A. Doyle, "Thales outlines thinking on single-crew cockpits", Flightglobal, July 2010], or collision avoidance systems are all systems that will demand high computing power.

Disruptive technologies are necessary to integrate such features in aircrafts given their stringent environmental constraints. The current trend of avionics systems is to integrate

different avionics functions in a common Integrated Modular Avionics (IMA) platform composed of a reduced number of computing units. The integration of decentralized systems into integrated modular avionics is thus a very important step in the reduction of weight due to reduction of different separate computing modules into less often centralized computing bays. In the context of environmental footprint reduction, each even very small weight reduction can lead to significant fuel savings over the lifetime of an aircraft and increase the competitiveness of this aircraft compared to international competitors. Such integration is also an effective way to reduce the number of computing unit types and so to improve the maintainability and serviceability of the equipment.

In this context, Thales is investigating next generations of IMA platforms. To this end, the solutions that are developed in EuroCPS Industrial Experiments will be key technologies to drive the design of such systems that will provide higher performance under the constraints of safety requirements.

Impacts on the space sector

Satellites are used for diverse applications like telecoms, TV Broadcasting, digital radio, navigation and localization, meteorology or earth observation (e.g., to study the environment and climate change). In the space domain, the need for higher communication satellite capacity as well as high-end onboard radar processing also pushes towards higher on-board processing power. Therefore segregation techniques and run-time QoS management solutions permit to take advantage of multicore performances together with safety constraints.

Roadmap toward exploitation of foreground

The exploitation plan of Thales is based on internal dissemination to promote the results of the Industrial Experiments and a phase of technology transfer to Thales business units. Internal dissemination activities have already been initiated but they will be pursued throughout all the duration of the project and after to present the progress of the project and the final results. The main actions regarding the exploitation of EuroCPS results aim for increasing the acceptance of these techniques in an industrial context for development teams. It involves to manage and reduce the risks related to the use of the tools for a commercial products, and to integrate the tools into the different design flows of the different business units.

From Thales perspective, considering the application domain that requires very strict safety norms, it is evaluated and expected that solutions delivered by the project will not be mature enough for internal use. Therefore a phase of maturation will be required before these technologies can reach the market. This will result in complementary critical actions, not only scientific and technical.
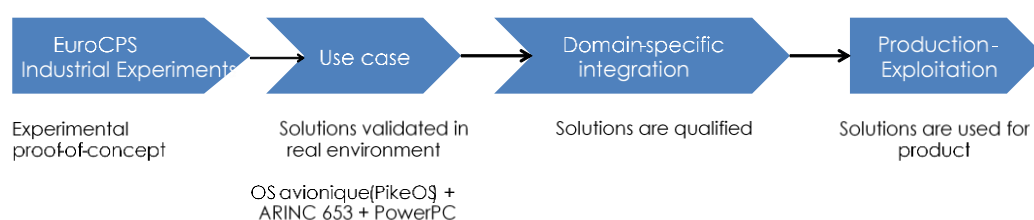

Figure 18: Thales internal process, from EuroCPS output to market product

Figure 19 shows the roadmap to increase the TRL. The planned process will allow Thales to manage the risks related to the use of new solutions and improve their acceptance by integrating them into already existing designs.
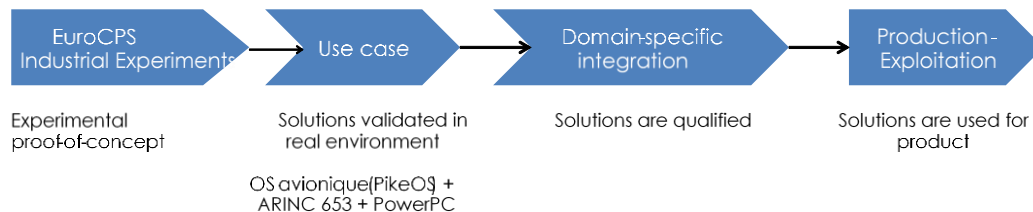
Figure 19: Planned progress of technology maturity

The exploitation in the different units of Thales will follow the exploitation process of the Thales group and be organized around:

- the TRT (Thales Research & Technology) research centers
- the R&D governance (Thales Technical Directorate, Key Technology Domains)
- the Competence Centers in Global Business Units
- the business lines (in Global Business Units)

The strategy of Thales for the exploitation of EuroCPS is based on the initial introduction of the project foreground in the application domains with the higher requirements, namely the avionics and the space domains. If the use of project solutions for aerospace and space applications is validated and approved, the proof-of-evidence obtained with a space and avionic use cases could support the introduction of these techniques in application domains with less stringent reliability requirements.

Figure 20 shows the estimated timeline for the exploitation of results with a sequential introduction of results in the different business units (to limit required technology transfer efforts and according to the importance of the results for the different business units). In order to move forward on the basis of the results, several maturation threads will be followed with the objective to deliver several outcomes to the Thales business units without excessive delay.
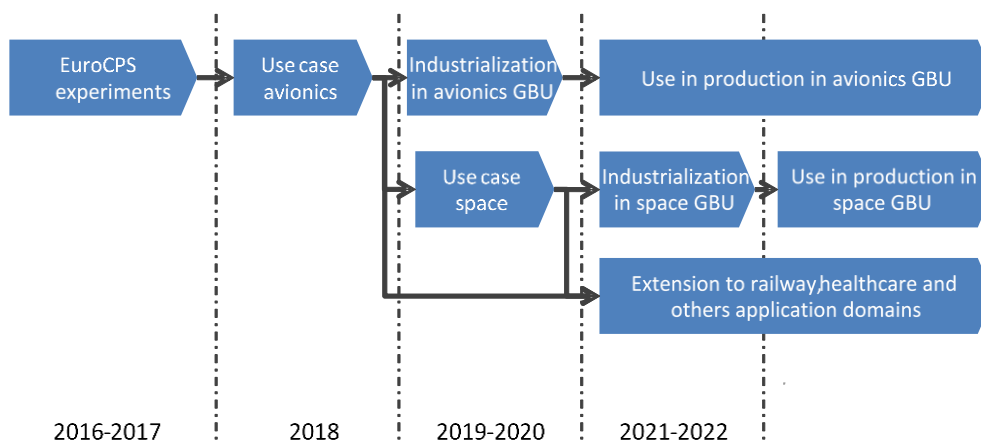
Figure 20: EuroCPS exploitation timeline

The industrialization phases in Thales business units will depend on the availability of an ecosystem around EuroCPS results. Different exploitation scenarios can be considered and will depend on the availability of results as a commercial product. The strategy of Thales is supported by the concrete intention to push the adoption of the results, based on its estimation of the improvement in competitiveness in its avionics and space business units.

Beneficiary	Exploitable new item (new product/service) short description	Competitive context		Exploitation plan			
		Identified Competitors	Added value of exploitable item	How? (Routes for Exploitation)	When?	By Whom? Potential users	Where? (in EU and/or other countries)
Thales	Safety critical computing platform	Honeywell, Lockeed Martin, etc	Highly integrated, highly dependable, mixed-criticality ready	Updated version of computing platform (avionics platform, space platform, or railway) maybe especially space	Updated platform development, then certification in relevant cases : 1 to 3 years from now, potentially later	Thales computing platforms used in various systems (avionics, space, railway) for instance Airbus, RATP, SCNF, Eutelsat, etc	Mainly EU, US
Thales	Time and space segregation solution	Many RTOS and hypervisor providers, with various qualification levels	Brings guarantees for safety constraints	Within computing platforms	Same as above	Within computing platforms provided by Thales	Mainly EU, US
Thales	Run-time guaranteed QoS solution	Still unmature solutions	Brings safety guarantees together with performance	Within computing platforms	Will require more maturation steps	Within computing platforms provided by Thales	Mainly EU, US

3.2.4. AVL LIST GMBH [AVL]

AVL LIST GmbH is the world's largest privately owned and independent company for the development of powertrain systems as well as simulation, instrumentation and test systems.

As innovation partner, one core competency of AVL is the capability to identify, create and industrialize innovative ideas toward innovative products and services. While already relying on a company structure combining on high skilled experts tightly connected to the world-wide customers, it is important for AVL to keep the door and mind open for promising ideas, technologies and markets. The possibility to present the Integrated and Open Development Platform as EuroCPS platform is for AVL the possibility to strengthen the discussion and cooperation with innovative companies, and finally to conjointly enhance the respective portfolio and generate new business (**EuroCPS as innovation multiplicator**). Hence, innovative companies are expert for new technologies and targeting different businesses, which are good complement to existing AVL technology and market, therefore leading to a win-win situation where both institutions can generate new business conjointly.

The automotive market is currently evolving very fast according to different key enabling technologies and evolution of legislation

- EU directive and respective (worldwide) legislations regarding limitation of pollutant emissions, leading to incentive for higher degree of electrification
- EU directive regarding diminution of road accident
- Introduction of autonomous driving and impact on the automotive market (from passenger car as a product to mobility as a service)
- Introduction of autonomous driving and convergence between smart transportation and other domains such that smart health, smart home
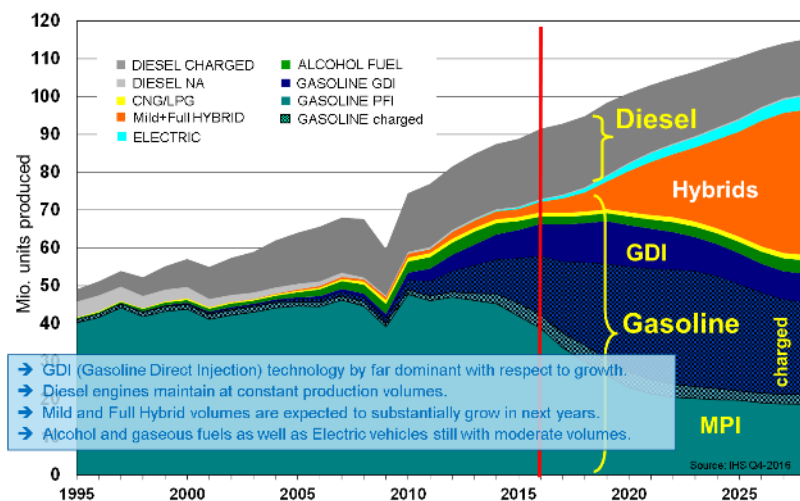
Figure 21: Global vehicle production by propulsion technology until 2028 (source: IHS Q4-2016[1])

As a result, market expectations regarding powertrain foresee a strong increase of electrification (grouping both hybrid and pure electric), with a downscaling of gasoline engine as a results of higher optimization and hybridization, see Figure 21. Parallel to that, autonomous driving functions – already present on the market for Level 1 and 2 – is expected to have a fast and high market penetration, see Figure 22.

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[1] https://www.ihs.com/industry/automotive.html

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**Figure 22: European Roadmap Smart Systems
for Automated Driving, V1.2, EPoSS**

The selected EuroCPS Industrial Experiments are fully in line with the main market trends identified

DATVS (call 1): "*Development and Automatic Test and Verification System*" supports the integration of this collected "real field" data into the simulation model generation. This IE supports the testing and validation of special and off road vehicles and tractors with implements. The proposed HIL system addresses in particular the market for autonomous driving which is furthermore necessary to cope with the challenges for precision farming.

HiLWaste (call 2): Design and development of a HiL battery waste heat simulator based on thermoelectric a heating polymer to be used as thermal battery simulator in virtual and real environments. This IE is targeting the electrification market and is relevant both for pure electric vehicles as well as for hybrid powertrains

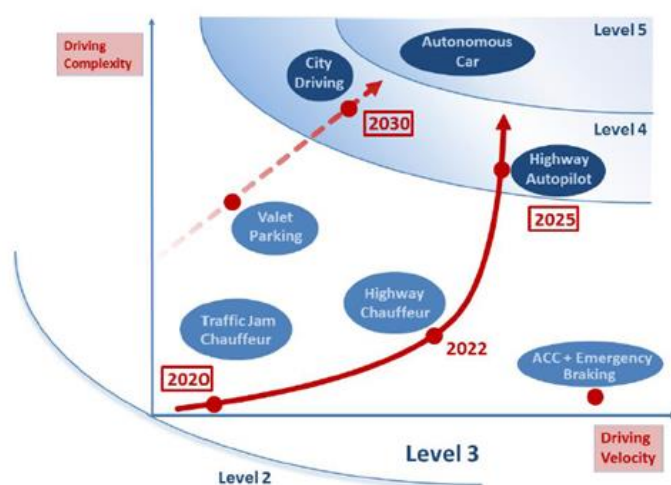**MACH65** (call 2): The specific objective of the project is the development of an advanced development platform, namely MACH65, based on the new generation of high-performance multi-core processor in 65 nm technology and ultra-smart driver concepts. This project is targeting the 3 cylinders engine market as one of the most promising architectures for the next years (engine downsizing, hybridization).

Hyper-SDF (call 3): The specific objective of the project is the development of an open powerful automotive development platform, namely HYPER_SDF, based on the proper combination of diverse high-performance multi-core processors providing outstanding processing capabilities while featuring a state-of-the-art safety architecture. This project targets the Advanced Driver Assistance System (ADAS) market, which is primarily driven by legislations pertaining to vehicle safety, changing preferences of customers, and increased demand for premium passenger cars as well as a progressive diffusion across the different vehicle's segments

Target: Strengthening B2B network
Main efforts: EuroCPS Year 1 – 2

Target: Creating innovation by running the industrial experiments
Main efforts: EuroCPS Year 2 – 3

Target: Creating business based on outcomes of the industrial experiments
Main timeline: EuroCPS Year 3, 1-3 years after end of project

Figure 23: Preliminary exploitation process for AVL

Following the preliminary exploitation process for AVL, see Figure 23, following status can be reported:

- **Strengthening of AVL B2B network** to stimulate cooperation between AVL (large company) and innovative SMEs. Besides the strengthening of the technology expertise, we expect an **easier entry and increase of market share for new and innovative markets**.

- **Creation of new technical assets** targeting the main automotive trends. This co-creation with technology champions provides an agile method to move fast on a highly dynamic market while relying on well implemented technology (IODP) and well-established market presence from AVL

The outcomes of EuroCPS in term of exploitation was positive. Regarding DATVS, the test environment provided by CDE could be deployed in a prototype way to showcase the increase of V&V efficiency in customer projects. AVL exploitation is focusing on internal deployment to increase internal efficiency, while CDE can further mature the solution toward product. Regarding HilWaste, the outcome provided by ATT could be used as information to extend AVL portfolio. The approach relies on addressing potential customer as partner and go for joint business. While writing the report, several joint customer discussions have been performed. For MACH65, the proposed asset from I&M was the possibility to extend AVL's portfolio by entering direct B2B as a follow-up of the IE. Similar services were provided by I&M to other customer as well, illustrating the relevance of this development on the market. Finally, regarding Hyper-SDF, the proposed platform was a door opener for further R&D collaborations, with the possibility to extend the scope of collaboration both in term of technical content and in terms of partnership. Hence, it was possible to include car manufacturers, which is highly relevant to prepare new businesses for the future.

Summarizing exploitation by AVL: all four IEs provided meaningful results, with for each of them different way to address exploitation. Furthermore, AVL positioning within EuroCPS (and in the follow-up project FED4SAE) makes AVL even more attractive for SME's ecosystem.

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Numerous discussions took places to evaluate new project ideas, which is very essential in AVL's innovation business.

3.2.5. INFINEON TECHNOLOGIES AUSTRIA AG [INFINEON]

- **Expected results:** Competence partners enabled to make efficient use of the IFAT platform. Better understanding of SME interests for further business increase**.**

- **Exploitation strategy:** Infineon's division Power Management and Multimarket (PMM) has a strong interest to understand the needs of SMEs because more than 50% (estimation based on business via distribution) of the European turnover is SME-business. To further increase this share it's necessary to understand SME needs even better. Asking for feedback, also from our competence partner Finepower, we learned that increasing development speed by offering evaluation kits is very attractive for SMEs.

  So IFAT decided to increase the number of CPS-applications where evaluation kits are available. This will help SMEs also beyond EuroCPS

  Benefits: Increase of semiconductor component demand by European third parties

3.2.6. FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V [FhG]

Beneficiary	Exploitable new item (new product/service) short description	Competitive context		Exploitation plan			
		Identified Competitors	Added value of exploitable item	How? (Routes for Exploitation)	When?	By Whom? Potential users	Where? (in EU and/or other countries)
Fraunhofer	Displaying of information, health & environment application for sensor platform	Other RTOs, various engineering offices	Highly integrated, flexible solution	New product form third party, strengthened or new collaborations with third parties, feedback on third parties needs to improve the supplied technology and to develop required technology bricks in the future	Starts right now	STM platforms used for maritime application and sensor application	Mainly EU

3.2.7. The Connected Digital Economy Catapult Limited [DIGICAT] -c

Digital Catapult is a market leading technology innovation and research centre aimed at scaling up young companies and helping traditional businesses make better use of digital technology, by bridging service offers from SMEs to digitization needs of large organizations. The company's goal is to make the UK economy more digital – and therefore more productive, faster growing and more globally competitive. The Digital Catapult collaborates with digital champions across industry and innovators from the academia and SME communities to unlock IoT specific challenges. The Digital Catapult benefitted from the EuroCPS project to support its mission to enable large-scale "real world" demonstrators to help innovators to prototype, test and grow their IoT ideas. EuroCPS allowed Digital Catapult to increase engagement with SME innovating in its target sectors and to experiment with novel technologies, by reducing the associated risks. Outcome of the supported EuroCPS project will fuel our innovation activities and regional nodes and enrich Digital Catapult offers in upcoming collaboration programmes such as the ThingsConnected one.

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Below we are summarizing the work we have done in relation to the ongoing EuroCPS experiments:

Cardio IE

We have closely worked with Spark Works by advising their product design through: support in privacy-preserving, GDPR compliant architecture for personal data management, with inclusion of tools to increase end-user transparency and control on how their data are accessed and used; helping refine the definition of their value proposition, as well as expanding their offers and outreach of new market segments through the integration of Low Power Wide Area Network connectivity capabilities. Spark Works has been participating to open innovation events such as Pitstops. Through their participation as an innovative company at the PwC Pitstop (https://www.digitalcatapultcentre.org.uk/event/pwc-pit-stop/) they had the change to be exposed to over 40 companies and experts looking to design the next generation of elderly care solutions, a growing market. Finally the Digital Catapult has also worked with Spark Works on their success story for the EuroCPS website.

IBT3 IE

Exa informatics has been advised on how to increase transparency and trust on how end-user personal data are collected and used by its developed system through the integration of Digital Catapult Personal Data Receipts, a GDPR compliance tool researched and developed by Digital Catapult team in order to lower the barriers to compliance to small and medium enterprises. Exa Informatics has become a member of the Digital Catapult contributors program and has been participating to open innovation events such as Pitstops, thus giving them the possibility to engage with further adopters of their technologies, in particular in the smart cities and retail context. Exa Informatics has been introduced to Heathrow airport off the back of our Visa Retail Pit Stop, an open innovation activities sponsored by Visa that took place on the 6th/7th October). The Digital Catapult has also worked with on their success story for the EuroCPS website. Finally the Digital Catapult supported Exa Informatics on the EuroCPS Bootcamp that took place at the Digital Catapult premises in January 2018.

AgriSense

NquiringMinds has been working closely with the Digital Catapult in order to refine the definition of its value proposition and receive advice on how to expand their offer through the inclusion of Low Power Wide Area Network connectivity capabilities. Due to their expertise in machine learning and AI technique, NquiringMinds have been selected as an expert company on the DSTL Pit Stop Event (https://www.digitalcatapultcentre.org.uk/event/dstl-pit-stop/), that Digital Catapult organized to support open innovation activities aiming at developing innovative solutions for smart transport and the use of transport-based data, including solutions working with sensors, edge computing, big data, automation, predictive analytics, and more. During the PitStop, NquiringMinds had the opportunities to engage with over 40 companies requiring its expertise to deliver the new generation of smart mobility services. The Digital Catapult has also worked with NquiringMinds on a case study which was published on the Digital Catapult website (https://www.digitalcatapultcentre.org.uk/case-study/nquiringminds/) and supported NquiringMinds on their success story for the SAE Brochure and the EuroCPS website. Finally the Digital Catapult supported NquiringMinds on the [HiPEAC18] CPS Success Stories Workshop in Manchester (January 2018).

Dissemination level: Public document (Pu)

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3.2.8. ALMA MATER STUDIORUM-UNIVERSITA DI BOLOGNA [UNIBO]

As an academic partner, UNIBO will not directly exploit the results of the project from a commercial point of view. As a consequence, the exploitation plan by UNIBO can be summarized as follows:

- Support to SMEs and creation of new collaboration links with the industrial world at regional, National and European level

- Further applied research in the field of IoT and CPS, leading to dissemination in international conferences and workshops, publication of books and journal articles, as well as IPR protection of the most promising ideas, in collaboration with the other EuroCPS partners and the supported SMEs

- Training of PhD students

- Industrial training courses and tutorials given at IEEE conferences

From this point of view, UNIBO represents an important socio-economic and cultural driving force for the territory it operates in: it is the primary research partner for the Emilia-Romagna region and for the regional branch of "Confindustria", the Confederation of Italian industry. The exploitation plans by UNIBO include the involvement of the Regional High Technology Network as well as the dissemination channels of UNIBO to promote the results and achievement of the project at the regional, National and international level. In addition, UNIBO will also leverage its participation to the KIC EIT ICT Labs to increase the visibility of the industrial experiments at the EU level, and to contribute and participate to training activities organized in the context of the ICT labs

3.2.9. LULEA TEKNISKA UNIVERSITET [LTU]

Luleå University of Technology (LTU) has three main tasks: research, education, and interaction with the surrounding society. Thus, exploitation of results stemming from research projects is not performed directly by the University, but LTU is to support the exploitation when being done by participating SMEs or spin-off companies. With this purpose, LTU has formed the company LTU Business AB (http://www.ltu.se/org/LTU-Holding/LTU-Business?l=en). LTU Business focuses on commissioned education, business development for small and medium-sized companies and the commercialization of research from Luleå University. The company is also commissioned to take business decisions about the intellectual rights that the company LTU License AB can buy from researchers at the University.

Thus, the SMEs working together with LTU within the EuroCPS project will have the possibility to be connected to LTU Business, in order to maximize the possibility for successful exploitation for the SME.

One of the goals for a University is to generate academic publications. The results generated in the industrial experiments have contributed to this under 2017 and 2018.

3.2.10. BUDAPESTI MUSZAKI ES GAZDASAGTUDOMANYI EGYETEM [BME]

BME has extended the operation of the EuroCPS design laboratory towards SMEs who do not have financial support from the EuroCPS Project. The goal is to achieve self-sustainability in 2-3 years. So far, as the EuroCPS project pays the salaries of the coaches working in the EuroCPS design Laboratory, the coaching is free for the SMEs, but the goal is that the service will be continued as paid service after the end of the EuroCPS project.

As BME has received further funding via the FED4SAE project this assures the operation of the EuroCPS laboratory for the next 3 years – for free consultation offered to SMEs and for educational purposes. PhD, Master and selected BSc students have access to the EuroCPS design Laboratory, in order to assure the continuous supply of expert available for SME coaching.

3.2.11. VERENIGING HIGH TECH NL [HTNL]

As a pure network partner (cluster organization), HTNL will not directly exploit the results of the project from a commercial point of view. The exploitation for HTNL will be as follows:

- Support to SMEs and creation of new collaboration links with the industrial world at regional, national and European level. A stronger community on CPS based systems will actively support and fuel the Dutch "Smart Industry" initiatives;

- Using the experiments granted in the Netherlands as working example HTNL does have a much stronger position to promote CPS development in the Netherlands in possible collaboration with the EuroCPS platform providers. This route has been initiated and will continue after completion of the EuroCPS project.

- As the SME companies addressed do not necessarily belong to the cluster organization of HTNL as formal member, the EuroCPS project will provide HTNL with the opportunity to actively scout for new member companies active in the CPS world. As such this will enlarge the association and provide more capacity for innovation activities for and with member companies also along axes using IoT/CPS.

3.2.12. Finepower GmbH [FPG]

Role in the project: Acting as a competence partner

Expected results: Expand know how from power engineering to power CPS engineering

Update: beside the extension of the power engineering services Finepower plan in addition to become power electronics manufacturer in order to generate more sustainable business for the engineering department inside Finepower

Exploitation strategy: Extended technology product portfolio with higher complexity grade

1) Extend connectivity portfolio with LoRa connectivity in cowork together with SME-Alitec.

   The extended interface strategy will also be extended by the new Finepower office in Czech which will be opened beginning of June. The main task of this office is the system integration of the power electronic platform developed by Finepower Germany. System interfaces will be extended.

2) Extend product portfolio in terms of OnBoardCharger – for Low-Voltage-Vehicles in cowork with SME- FEAAM. After IE FEAAM and Finepower will cooperate further on power electronics. A next project concerning DCDC converter to low voltage rail is currently in planning. End 2017 the second part of the OBC was developed together with FEAAM in order to have the OBC running mid of Q2018.

3) Further cooperation with FEAAM is planned in the business area of wireless charging and very high power projects where Finepower acts as the power electronics partner and FEAAM as the design partner for magnetic coupling systems for the inductive charging.

4) Go into new business opportunity: Finepower as manufacturer of Power electronics in cowork with SME- enfas (sofar Finepower is only engineering service provider).

   Enfas and Finepower are planning cooperation in production of storage systems where Finepower will act as provider for power converter devices.

5) Further business opportunity with enfas is planned as system charging provider for the automotive section.

Benefits: New technology will result in new employment

Update: 1) – 2) for the new technologies Finepower is currently actively search for new R&D engineer

   in HQ Germany Finepower employed in the meantime 3 engineers

   and a new engineering office will be opend in Czech beginning of June

  3) research activities with FEAAM in the field of inductive charging is already started

  4) for Power electronics manufacturer Finepower plans new employees for Qualification,

   Certification and after-sales service

  5) enfas and Finepower already have an active partnership in contacting providing engineering and product development in the automotive field world wide

Timescale: Short medium and long term.

update:

1) extend by LoRa	End 2018
2) extend OBC Low Volt	End 2017
3) researd high power ind. Charg	Beg. 2018
4) manufacturer of electronics	Beg 2019

Dissemination level: Public document (Pu)

5) enfas & Finepower cooperation   Beg. 2018

3.2.13.   *STMICROELECTRONICS SRL [ST-I]*

STMicroelectronics, offering one of the industry's broadest product portfolios, serves customers across the spectrum of electronics applications with innovative semiconductor solutions that make a positive contribution to people's lives.

Due to the fragmented nature of the Internet of Things, the markets we serve span our entire customer base – from our largest customers to the tens of thousands of smaller and equally important customers who we serve through our distribution partners and mass-market initiatives.

ST-I, supporting EuroCPS activities on SMEs' Industrial Experiment, intends to foster the SMEs' innovative ideas and recognize the possible constrains, obstacles and limitations on adoption of our solutions for the development of new functionalities and capability required for new CPS applications market.

Technology innovations have to be placed inside the final products-services to reach the market.
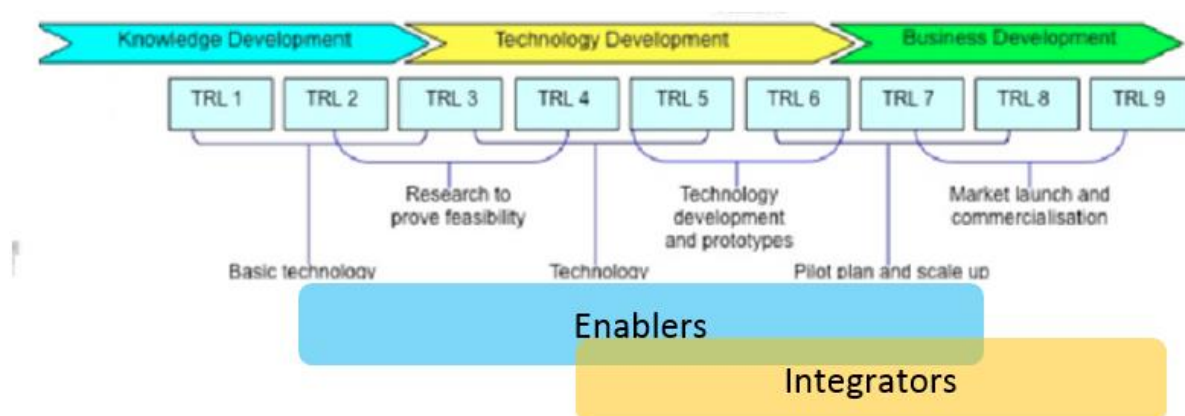
Previous figure reports the area of activity that we typically recognize for technology enablers and technology integrators in the product value chain.

This, on the Integrator side, requires the capability to develop final marketable products and, on Enablers side, to lower possible barriers and shortage allowing to better catch the technological potentiality and a higher grade of achievable innovations by means of the use of advanced and sophisticated electronic devices.

Only for example, it is estimated that 80% of all innovations in the automotive industry, today, are directly or indirectly enabled by electronics, which means a constant increase in the semiconductor content per car year after year.

For different domains, that already are characterized by a large adoption of semiconductor content, this generally means a pervasive introduction of specific wireless and wired communications, a constant improvement on elaborations and storage capabilities, and ever more "integrated" functionalities and higher speed on system clock, pursing a deeper and larger digitalization of the context.

Availability of advanced technological solutions is at the base of enhancing of goods and services, but this is possible only providing adequate support, especially for SMEs that for their nature generally have a niche focus and/or limited resources.

The activity developed in EuroCPS allows us to reinforce our propositions on mass market, better addressing the needs of new integrators so to facilitate the development of customer loyalty, also.

Another advantage due to the EuroCPS project is related to gather the SMEs' innovation skills and the incoming trend on requirements and expected characteristics for electronic devices for CPS applications, overcoming the large distance between ST, as silicon solutions provider/enabler, and final market goods developers.

This is in line to keep our technology edge that, further an unwavering commitment to R&D, requires to provide the adequate accessibility to our solutions to support their larger adoption.

3.2.14. INTEL [INTEL]

Intel Corporation engages in the design, manufacture, and sale of computer, networking, and communications platforms. It operates its business through the following groups: Technology Manufacturing Group, Client Computing Group, Data Centre Group, Internet of Things Group, Non-Volatile Memory Solutions Group, Intel Security Group, Programmable Solutions, and Artificial Intelligence Product Group and Sales and Marketing Group. It has over $60 billion in revenue, 100,000 employees worldwide of which 23,000 are the European region supporting the key business units.

Figure 24: Intel R&D sites across the European Region

Figure 25: **Intel Ireland Fab Manufacturing Facility.**

Intel Ireland's Leixlip campus, located in County Kildare, began operations in 1989. Since then, Intel has invested over $13.9 billion in turning the 360-acre former stud farm into one of the most technologically advanced manufacturing locations in Europe. The Leixlip campus is home to a semiconductor wafer fabrication facility which produces latest generation silicon microprocessors that are at the heart of a variety of platforms and technology advancements which are essential to the way we learn, live and work today. Today, more than 5,000 people work at the campus and following a $5 billion upgrade, the facility manufactures the latest generation Intel process technology on 300mm wafers. A range of roads based on the Quark range of Microcontrollers which were seeded into the EuroCPS Project were developed at the Ireland site.

Intel is in a transformation and moving from a "PC Centric" Company to a "Data Centric" Company and that transformation accelerating. In Q1'18 Intel's Revenue of $16.1B, up 13% on strength across datacentric businesses. The company generated $6.3B cash flow from operations and returned $3.3B to shareholders and raising full-year 2018 revenue of $67.5B – our best year ever. The Data-centric businesses reach all-time high, approaching 50% of revenue with strength across all segments of Data Centre Group. Intel FPGAs winning data center designs…

Mobileye demonstrating [Autonomous Driving leadership.](#) The fabs are shipping Industry leading products on 14nm and starting to ship low volume 10nm with high volume shifting to 2019.

Intel's path to market place . In the main, Intel does not sell branded products directly to end consumers. While it does design, develop and manufacture motherboard chipsets, network interface controllers and integrated circuits, flash memory, graphics chips, embedded processors and other devices related to communications and computing, these technologies are brought to market through a global ecosystem of B2B partners.

For the **IOT/CPS Markets**, Intel uses distribution partners referred to as "disti's" such as Arrow, Rutronik, Mouser and RS Components to distribute building block components directly to consumers in the IOT markets. Intel also partners with companies such as Advantech, Ingram, Kontron, Dell, AAEON, Arrow Electronics, Arris, who provide range of Intel based Gateways, Single Board Computers, Set Top Boxes etc.

A number of these are members of Intel Technology Provider programme which assists their customers to develop solutions using components from Intel and integrates them with other hardware / software components and develops the final products which are brought market along with their support and maintenance services. These ITP partners are distributed worldwide and have both the technical and domain expertise in their specific local markets. They receive early access to new technologies, training, support and access to technical expertise. More Info https://www.intel.com/content/www/us/en/technology-provider/overview.html

Within the context of EuroCPS, Intel seeded the following range of maker / developer boards into the programme. These boards are early stage low cost developer boards, compatible and extendible with the Arduino family so that they accelerate education and enable low cost prototyping and rapid application development. These board come with a range of IDEs, SDKs

toolchain incl. energy profiling etc. or support secure embedded OS such as Zephyr https://www.zephyrproject.org/.

Considering the relatively low volume of unit sales that were generated from EuroCPS Project, it would be unrealistic to expect that EUROCPS could have a dramatic impact on Intel product roadmap, however, that said, during the various application experiments, the Quark Product team based in Ireland were actively engaged in supporting the end customers to understand their needs and how the platforms were being used and to get feedback so as to influence future product roadmaps. Specific example was the UK Sparkworks Cardio Project where the SME was having difficulties in using the pattern classifier and as a result of these interactions a number of improvement to the SDK was made to improve the ease of exploitation of the module. Also they Quark team were interested to see both novel use cases and to understand how the devices were being integrated – what was the comms and software stack and battery or mains powered used cases.

While the global market is huge for microcontroller market, it is highly competitive and well served by a large range of players from ARM Ltd, Cypress Semiconductor, Fujitsu Semiconductor Limited, Infineon Technologies, Microchip Technology Inc., NXP Semiconductor N.V., Panasonic Corporation, Renesas Electronics, STMicroelectronics, Texas Instrument Inc. and the market is expanding at a modest 5%-8% per Annum according to various analysts.

During 2017, Intel has made a strategic shift to focus more on higher end compute and connectivity platforms opportunities that are more closely align to its traditional strengths and with more focus on the B2B rather than B2C (end consumer/maker). Following a Corporate review in 2017, Intel announced a Product Discontinuation notice in July for the range of maker boards and announced that that it would be discontinuing Edison [PDF], Galileo [PDF] and Joule [PDF] and CURIE compute modules and boards over the second half of 2017. While the discontinuation of these products is disappointing there was no impact to the EuroCPS
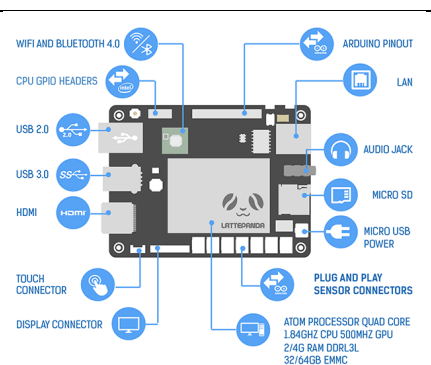
Experiments or underlying Microcontrollers and these are still commercially available and powering a range of gateways and other devices from a range of OEMs.

To keep its fabs full and exploit the economics of Moores Law, Intel focuses on high volume mass manufacturing and it does not like to compete directly with its partners. There are a range of Intel based developer boards available from partners such as AAEON, Late Panda etc that serve these end user markets and integrate intel compute platform with various communication and OS stack in maker (Arduino compatible) / developer ready platforms.

LATTEPANDA https://www.lattepanda.com/ LattePanda provide a range of developer boards – The Panda is the first development board that can run a full version of Windows 10! It is turbocharged with an Intel Quad Core processor and has excellent connectivity, with three USB ports and integrated WiFi and Bluetooth 4.0. It also includes an Arduino co-processor that enables the developer to master the physical world by controlling interactive devices using thousands of plug and play peripherals.	
Aaeon an ASUS Company Aaeon provide a range of Maker / Developer Atom and Core, FPGA and Movidius VPU AI Boards. https://www.up-board.org/ They focus on assisting customers to bring integrated solutions to the market and provide a range of Intel based 'market ready' platforms to accelerate that process. AAEON offers customized end-to-end services from initial product conceptualization and product development on through to volume manufacturing and after-sales service programs.	

Going forward, we look forward to continuing to support those SME that have developed prototypes on Intel platforms and are committed to assist them in whatever way possible from finding a scaling partner or a market ready platform - many of which are listed on the website

listed below where customers search and filter from thousands or platforms that meet the needs of specific markets such as medical, industrial, retail, military etc https://solutionsdirectory.intel.com/browse-by-type/Hardware-Components/embedded-iot

4. SME Exploitation summary

The exploitation summary is based on the feedback which was given by the SMEs at the end of their industrial experiments.

During the third period an extended template for a questionnaire was created (see D1.6 "*Final activity and Management Report*") and send to the SMEs (template is available in Annex 1).

To collect all the data discussed in the current section, the final version of the questionnaire was used for most of the SMEs. For the few SMEs that had already finalized their experiments during EuroCPS second period (and whose review took place at the 2nd review), the collected data are based on the version of the questionnaire available out of the second period. But all the other SMEs filled out the questionnaire.

The questionnaire was mainly about updated business plans, the market context and their go to market strategy. We took also the opportunity to ask the SMEs during this survey about satisfaction with EuroCPS, co-work with platform and competence partner and others. The results of this survey are listed in the individual SME exploitation feedback. But the details/figures are not public data and therefore cannot be part of the current deliverable.

The final questionnaire was extended by weighting factors in order check the performance of the experiments: progress in TRL, duration of the IE, Product and Service Maturity, Product differentiation, finance stability, IP and skills, partnership, scientific and general publication.

The individual Exploitation Activities of the SMEs are described in an additional report (D5.7 "SMEs questionnaire / individual exploitation plans) that is a separate document. As the data (collected through the questionnaire just mentioned) consist of confidential company information of every SME, this document related to the SMEs' individual exploitation activities is EuroCPS internal only. All the data presented in §4 were obtained by combining all the SMEs' data. SMEs and projects are listed in annex 2.

The following tendencies can be observed for the Revenue, the employment and the total company revenue.
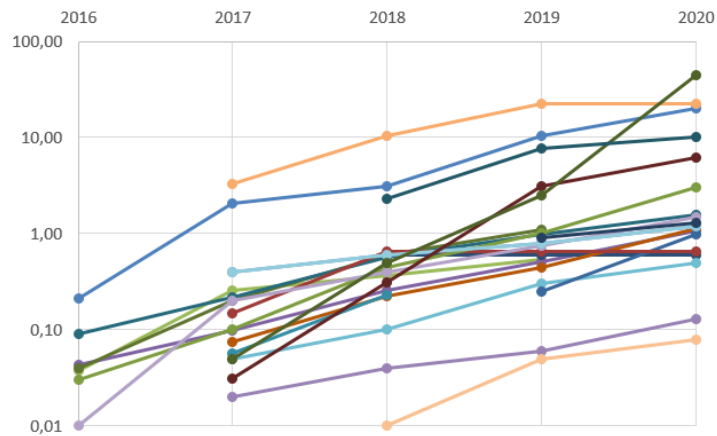
- **Revenues**

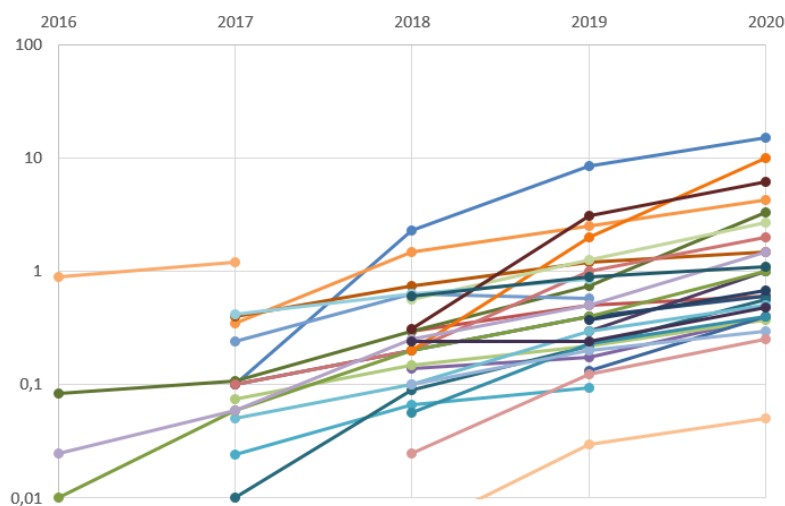**Figure 26: Initial business plan: Revenue [Mio EUR] - log**

Figure 27: Business plan@ Project end: Revenue [Mio EUR] - log

The comparison of the business plans at the initial stage and at the end of EuroCPS shows the following results:

- Initially, few SMEs wanted to start their business based on their Industrial Experiment in 2016 and the majority of them wanted to start in 2017.

- Finally few SMEs managed the start of their business based on EuroCPS outcomes in 2016, a significant portion of the SMEs started this business in 2017 and a couple of SMEs postponed their business start up to 2018.

Relatively to the forecasted revenue, an average shift of the business plan by approximately one year is generally observed.
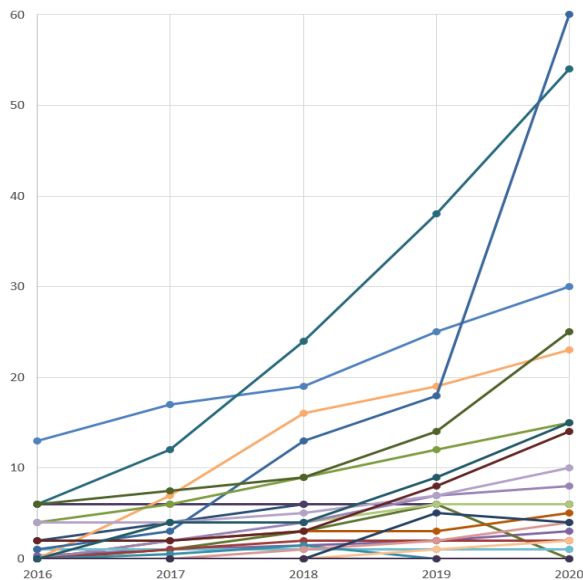
- **Employment**

Figure 28: Initial business plan: Employment related to the IE

Remark for Figure 28: when SMEs did not provide continuous data over the total period the graph gets back to 0.
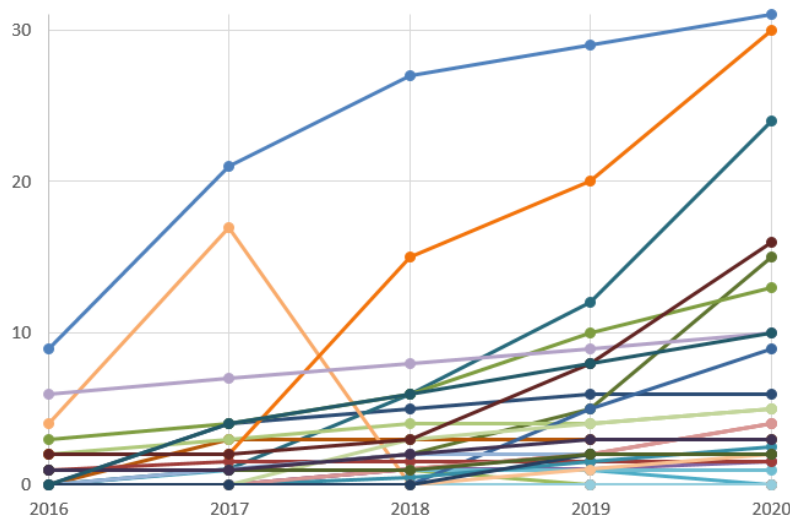

Figure 29: Business plan@ Project end: Employment related to the IE

Remark for Figure 29: when SMEs did not provide continuous data over the total period the graph gets back to 0.

When comparing the IE related employment figure at the initial and the final stage of EuroCPS IE, nearly equally positive and negative deviations can be observed. This means that some companies hired more employees than initially forecast at early stage and some companies hired less employees than planned. Generally observed there is no big deviation between

forecast and real employment considering the development plan from 2016 to 2018. An exact calculation of the average deviation shows a deviation of 0.3 employee.

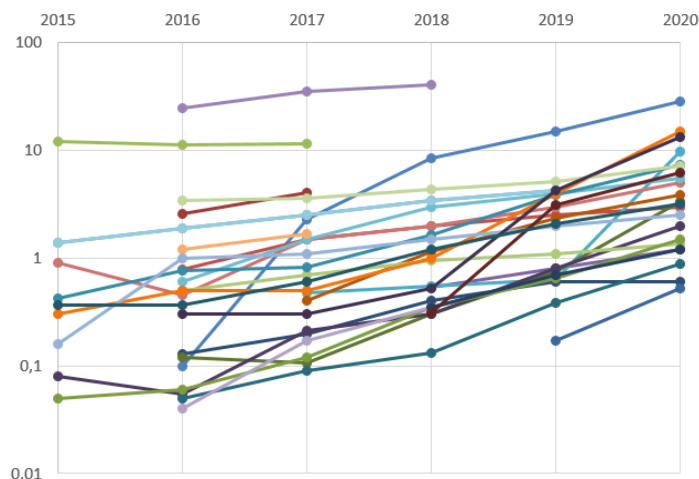- **Total company Revenues & Employment**

Figure 30: Total company revenue [Mio EUR] – log:

Figure 30 shows the development of every SME´s revenue. Considering the years 2015 to 2018 there is an average rise of 70% every year. The revenue growth expectation of the SMEs is the same for the coming year. It can be pointed that the 2 companies with higher revenue show the following tendency: the bigger the company is, the less feasible the ratio rise seems to be.
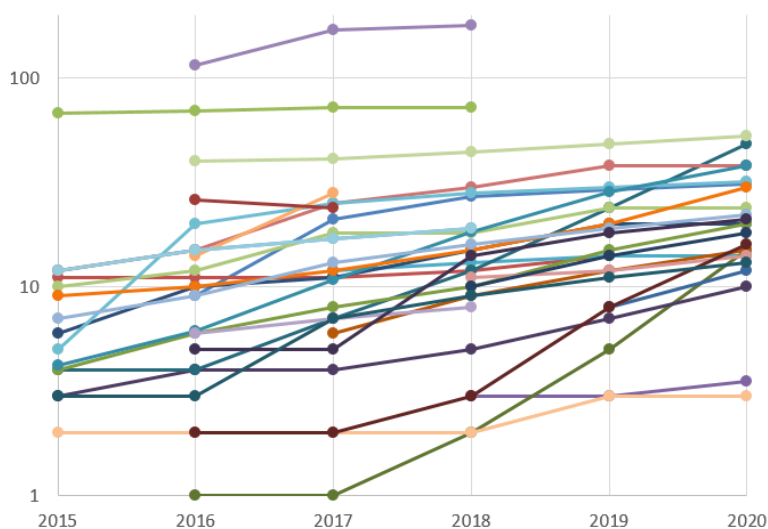

Figure 31: Total company employment - log:

Figure 31 illustrates the evolution of total employment of every SME. Considering the development over the years 2015 to 2018, it can be seen that some companies show nearly no rise of the employment figure whereas some others show rising rates of more than 100%.

One company even managed 200% employment rate increase. Considering all the companies, an average increase of 35% each year is observed.

- **Overall summary of SME Exploitation**
  - Employment related to EuroCPS:

Figure 32 shows the sum of all additional employment related to EuroCPS industrial experiments of all the SMEs who funded by EuroCPS.

The rise of employment stated by the SMEs until 2018 is real growth of the companies whereas the data for years 2019 and 2020 are forecast ones. The gradient of the growth calculated until today is very close to the the forecast one.

Conclusion:

- 103 new jobs have been created with the help of EuroCPS until 2018.
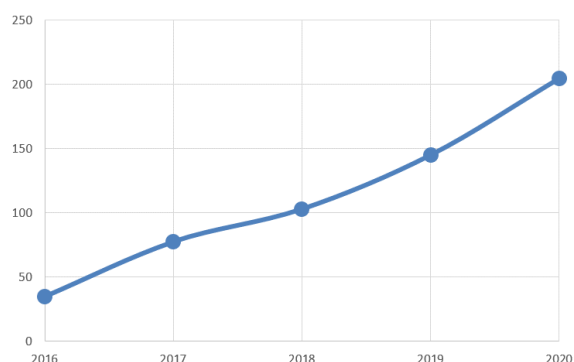- Further constant growth is expected for the next years (200 new jobs until 2020).

Figure 32: company employment related to EuroCPS (industrial experiments)

  - Revenue related to EuroCPS:

Figure 33 shows the sum of the additional revenue for all the SMEs related to EuroCPS industrial experiments.

The rise of the IE related revenue stated by the SMEs until 2018 corresponds to real growth of the companies whereas the data for 2019 and 2020 correspond to forecast data.

The gradient of the revenue growth shows an exponential function.

In order to interpret whether this growth is realistic, let us have a close look to Figure 30. There it can be seen that the smaller companies (1 to 20 employees) show indeed a rise of the revenue which is exponential (logarithmic = straight line). Bigger companies like the 3 biggest SMEs of EuroCPS show a reduction in revenue growth.

Conclusion:

- EuroCPS - Project created 10 Mio Euro additional revenue until 2018.

- As most SMEs in EuroCPS are small companies, an exponential growth over the next coming years is most likely to take place (27 Mio € until 2019).
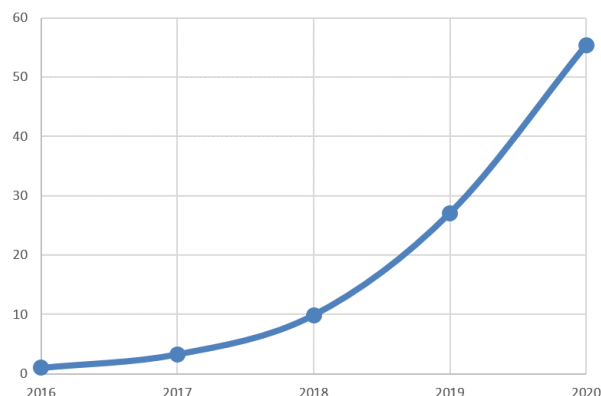

Figure 33: Company revenue related to EuroCPS [Mio EUR]

5. Conclusion

This deliverable reports all the networking events, Dissemination plans and Exploitation Activities organized and achieved by the EuroCPS partners.

A list of forums, fairs, workshops and other events related to IoT and CPS technologies, is described in this deliverable.

The exploitation summary of the SMEs, based on a dedicated questionnaire, shows that the small companies perform significantly better than the large ones, relatively to revenue and employment results.

An average delay of one year was observed in terms of business targets, but the business figures are comparable to the figures indicated in the submitted proposal. The final (updated) data show that most of the SMEs started their business related to the EuroCPS industrial experiment outcomes.

Annex 1: Template for the questionnaire for final assessment of SME- Exploitation

EuroCPS
Cyber-Physical Systems

SME – Exploitation – final assessment

1 - general IE figures: (pre filled in by networking partner)

project acronym:

SME:

networking partner:

competence partner:

platform provider:

[list all the platforms you are using, in case your project integrates more than one, list all of them]

short project description:

[Describe in 15 lines what is the purpose of your project – technical results of IE

but the description should not be too technically in order to be understandable for a non-technical person]

project start:

project end:

business plan described in proposal for industrial experiment:

[The initial figures provided in the IE proposal.]

	2016	2017	2018	2019	2020
revenue based on IE					
employment based on IE					

2 - Market context:

[describe in 15/20 lines the market targeted by your IE.

Describe the targeted market with key figures and key actors

- o customers:
- o competitors:]

3 - updated business plan:

[These are the updated figures provided in the IE proposal. I it is information which is informative and cannot be a strong commitment. Its confidentiality will remain inside the consortium partner and will not be shared with any other SME]

	2015	2016	2017	2018	2019	2020
revenue based on IE	-					
employment based on IE	-					
total company revenue						
total employment						

n/a…not applicable
1…...low differentiator/priority
4…...high differentiator/priority

effect on jobs during the execution of the IE	differentiator
What progress has the company made since entering the programme to progress their TRL Level	(n/a ,1..4)
jobs created during the execution of the IE:	
jobs transferred from temporal to permanent during IE:	

3 - From prototype to product

- [The purpose of this paragraph is to give visibility on the plan to transform a EuroCPS prototype in product manufactured in volume
- Explain the main activities (15/20 lines) on going or foreseen, to convert the EuroCPS prototype in a commercial product (investment in manufacturing, Product design, mass production preparation, …)

progress in TRL level	differentiator
What progress has the company made since entering the programme to progress their TRL Level (see appendix)	(n/a ,1..4)
TRL @ project start:	
TRL @ project end:	

Euro CPS Industrial Experiment duration	differentiator
could the IE be executed in time	(n/a ,1..4)
forecast of IE duration @ project start:	
final duration of IE:	

Product or Service Maturity	differentiator
What progress has the company made in crossing the chasm into the Market with a CPS Enabled Product.	(n/a ,1..4))

Dissemination level: Public document (Pu)

OR Growing Market Share	
Have there been investments in facilities, production or test equipment?	
description:	

Product (or Service) Differentiation	differentiator
how does the product differentiate to your competitor (CPS feature, non CPS feature, product novelty, certification- compliance, quality, price, others) or how difficult is it for your competitor to enter your market (use of trade secrets, no reverse engineering possible, technology leadership, strong or exclusive partnership, others	(n/a ,1..4)
description:	

Private / Public Funding OR Revenue Pipeline	differentiator
How much additional funding have the company secured from either Private or Public sector grants. (are there follow up funding- or R&D- projects)	(n/a ,1..4)
description:	

IP: Patents (submitted or secured) and other IP	differentiator
How many additional patent submissions have been created related to CPS product? other IP (not covered by patent) which is hard to copy by your competitor ? other innovative work which secures your business?	(n/a ,1..4)
description:	

Personnel Skills of the SME	differentiator
Development / Access to CPS Skills - EuroCPS has enabled the Growth of the competencies or Skills in the SME by partnering with the Consortium members. (or enhanced their existing product with CPS capabilities)	(n/a ,1..4)
description:	

others:	differentiator
	(n/a ,1..4)
description:	

4 - Goto market strategy

- *[[The purpose of this paragraph is to explain how your company will address their customers. It will help in understanding how the product will be sold and then the success opportunity.*
- *Describe (15 / 20 lines) the short term actions ongoing or foreseen to reach your customers (opportunities, Joint marketing, advertisement, Trade shows, Dissemination activities, …)]*

Partnerships to advise, to scale, to finance	differentiator
How strong is the Company's Track Record of bringing innovative products to market, Technical Depth, Ability to innovate, access to capital, knowledge of their specific market, compelling business strategy to target the market both short and long term, partners to get market access	(n/a ,1..4)
description:	

Publication (Scientific Journal)	differentiator
How many publications have been generated, submitted, presented eg. published in a Tier 1 Journal, technical or business journal	(n/a ,1..4)
description:	

Public Relations - Media , Press	differentiator
How must positive press article have they been able to generate …and how widely distributed has the media attention been - local/national/international paper publication and web content/social media	(n/a ,1..4)
description:	

others:	differentiator
	(n/a ,1..4))
description:	

5 - Impact of EuroCPS

[*This paragraph is intended to give some feedback about the EuroCPS approch regarding hte IE. The goal is to gather feedback about strong and weak point of EUroCPS and then how it could improve in the future.*

- assessment of:
  - ○ Founding rate fair:
  - ○ Budget distribution [25% @ start,…., 5% @ IE closure]
  - ○ Administrative effort:

- o Founding project related to CPS / IoT:
- o platform (satisfaction with the PF, performance of PF, quality, development time…)
- o Cowork platform partner:
- o Cowork competence partner
- o general improvement potential
- o others:]

How can help EuroCPS for further progress of Industrial experiment

[*This paragraph is intended to ask the SME if there are technical or business plan issues which are not on track and maybe some other partner in the consortium could help eg. with extended contacts to potential customers etc.]*

- o technically
- o business plan / Geographic proximity of solution provider / language restrictions / access to decision-makers in big companies /
- o others

Annex 2: List of the granted projects

ID	Third party	IE Name	Competence partner
IE#01-13	**Greenwaves**	MGIoT	CEA
IE#01-21	**HungarLux**	Smart SSL	BME
IE#01-06	**Mikrolab**	Multifunctional graphical universal data display	FhG
IE#01-11	**Winet**	LTIS	UNIBO
IE#01-14	**FentiSS**	MCS-MX	Thales
IE#01-04	**CDE**	DATVS	AVL
IE#01-20	**Neumann DX**	SmartLAB	BME
IE#01-28	**Suricog**	WEETSY2	CEA
IE#01-08	**Exa-Informatics**	Innovation Branding Through Trusted IOT	Digicat
IE#02-39	**Nestwave**	uLPGPS	CEA
IE#02-07	**Spark Works ITC Ltd**	CARDIO	Digicat
IE#02-10	**Encore Lab S.L.**	CNODE	CEA
IE#02-28	**Ideas & Motion S.r.l.**	MACH65	AVL
IE#02-20	**APIX Analytics**	GOSPEL	CEA
IE#02-04	**NquiringMinds**	Agrisense	Digicat
IE#02-08	**Industrie Elektronik Brilon**	Charger Guard	FPG
IE#02-43	**Terabee**	WOA	CEA
IE#02-13	**enfas GmbH**	ECESS	FPG
IE#02-30	**EUROB CREATIVE**	3DGxGlove	Unibo
IE#02-12	**Concurrent Engineering Experts Conex AB**	D3DSM	LTU
IE#02-33	**Stoorm5 srl**	PPSF	Unibo
IE#02-22	**ATT advanced thermal technologies GmbH**	HiL waste	AVL

ID	Third party	IE Name	Competence partner
IE#02-31	**Globalsensing technologies**	NeuroCPS	CEA
IE#02-25	**HIPPEROS S.A.**	IMICRASAR	Thales
IE#03-08	**Van Mierlo**	SmartFlush	HTNL
IE#03-1	**Tellab**	Aquamonitrix	BME
IE#03-37	**WP2P**	SelfCommNet	LTU
IE#03-15	**Ideas & Motion S.r.l.**	Hyper_SDF	AVL
IE#03-16	**Devlab**	IN-VITRO	BME
IE#03-36	**Encore Lab S.L.**	SeizSafe	FhG
IE#03-42	**LinQvision**	TT-LinQ	LTU
IE#03-7	**Feaam**	ISCAD Charger	FPG
IE#03-23	**Altreonic**	NoFiST	Thales
IE#03-40	**Alitec**	SolarSensNet	FPG