

## EUROPEAN COMMISSION - HORIZON 2020



# Accelerating European CPS Solutions to Market

# Deliverable D6.8 WP6 Annual report #2 on Ecosystem Building Activities

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## **Executive Summary**

The WP 6.1 "*Ecosystem Building*" task is aiming to describe the current state of the ecosystems surrounding the involved DIHs to look at: "Who are the main entities?" and "How are they connected to each other?" Secondly, the task aims to understand the different learning opportunities within the ecosystems; both to see what exists and to understand how these learning opportunities are utilized.

By understanding the different players in the ecosystems and the needs in regards to learning they have, it will be possible to identify gaps in the learning market that could be addressed by the DIH's over time.

Hub Sustainability is a separate task (Task 6.3) that is dependent of the outcome of this task. Therefore, there is a collaboration between the two tasks.

A task force within the FED4SAE project is now identified, with representatives from each DIH that are responsible for their local ecosystem.

The activities are divided over a couple of steps with a corresponding analysis of the collected data. A method to visualize the collected data has been presented and some early conclusions have been drawn. It will now be a task for the project to discuss how this result should be used as one of the foundations for the long-term sustainability of the DIHs.



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## 1. Introduction

The FED4SAE Ecosystem Activities provides the participating Digital Innovation Hubs with a good overview of the ecosystem that they are active in. These activities also contribute to the long-term sustainability and growth of major project outcomes. In relation to that, the FED4SAE Project aims to engage and build a growing community of active players, from industry, SMEs, start-ups, Midcaps and the researcher community, to facilitate the creation of an integrated sustainable ecosystem of stakeholders active in the Cyber-Physical Systems domain. To achieve this objective, the FED4SAE consortium will gradually and systematically build up and mobilize a large industrial community committed to adopt and exploit the results in a sustainable way, during and beyond FED4SAE.

The objective of Task 6.1 is to *describe* the FED4SAE Ecosystem from the perspective of learning opportunities, provide an *analysis* of available learning opportunities to indicate which are the most valuable to whom, and make it possible to *act* on this analysis when engaging with Third Parties.

Examples of actions that are possible to take based on the analysis;

- Find the right companies or organisations to pinpoint for new learning offerings
- Companies or organisations to invite/engage for certain events
- Popular trainings that could be replicated in other domains or locations
- Find gaps in the training offering

# 1.1 Task Objective

This task will be dedicated to building a network of stakeholders around the platforms and technologies supported by the different FED4SAE centres for their focused smart domains, to support establishing user-supplier relationships and to enable the exchange of learning assets (e.g. best practices). A central element in building such innovation eco-systems to achieve synergy will be to establish links between the FED4SAE centres and other existing regional and national innovation hubs. The task will comprise the following set of activities:

## Understand the FED4SAE eco-system by:

- Create a validated inventory and network mapping of offerings of the FED4SAE centres and other relevant entities to which centres have access by distributing questionnaires and/or performing interviews of FED4SAE partners and experiments. This primarily includes identifying key firms, key research institutes, key academic partners, learning networks, innovation centres, digital hubs, incubators, investors and funding programs.
- Develop an analysis of the eco-systems existing around the FED4SAE centres based on inventory. Focus is (a) eliciting learning opportunities, such as courses and common interests, and (b) understanding obstacles to leveraging on these opportunities.
- Based on aforementioned inventory, at regular intervals of the project, develop an understanding of current offerings of exhibitions, courses and workshops.
- Distribute questionnaires to both Third parties suggesting an application experiment and to those who contact the centres outside the open calls to elicit what forms and content of learning opportunities are of interest to them.

• Based on aforementioned questionnaire, at regular intervals of the project, develop an analysis of Third parties. Of particular importance are businesses whose proposals have not been selected in the open calls and those who contact the centres outside the open calls. Focus is matching the Third parties with activities mentioned in the next section ("Encourage...").

## Encourage collaboration within the FED4SAE eco-system by:

- Connect to external innovation support organisations to promote Third parties supported by FED4SAE through their participation at relevant events. Of particular importance are supporting cross-domain opportunities, e.g. highlighting relevant business and learning opportunities in other domains. Focus is on exhibitions, courses and workshops.
- Invite external stakeholders to "community events" organised by FED4SAE centres around their supported platforms and technologies for their focused smart domains, to inform about new developments, showcase experiments, and exchange experiences. Again, of particular importance are supporting cross-domain opportunities.
- Develop internal, relevant visualizations and catalogues for the aforementioned inventories, network mappings, elicited offerings and learning opportunities. Provide other WPs in FED4SAE with these for facilitating creation of FAQs for newcomers, networking, etc.

# 1.2 Activities in Year 1, September 2017 – August 2018

Task 6.1 started by KTH contacting all partners in the project to map out the FED4SAE ecosystem. It soon became apparent that several partners perceived how to define the ecosystem, and how to engage with it to create valuable outcomes, differently.

After meetings had been organised to arrive at a common understanding all partners were asked to provide information on the learning opportunities available in the ecosystem. Data was gathered and summarized during several months in the spring of Year 1. Unfortunately, the information received during the spring of 2018 was patchy and varied in focus. Despite several attempts, it was not possible to develop a coherent analysis on the available data.

# 1.3 Activities in the Autumn of Year 2, September 2018 – December 2018

To move forward a new approach was created:

- To arrive at a more coherent perspective only the Digital Innovation Hub partners (henceforth called DIH partners) were invited going forward. After additional opt-outs from these partners, those that remained were Digital Catapult (UK), Fortiss (D), CEA (F), CSEM (CH) and UNICAN (ES).
- KTH met separately with each of the DIH partners to emphasise the focus going forward. The partners agreed to gather the requested data in preparation for a meeting with all involved partners during the spring of Year 2.
- Which data to gather was redefined (see Section 2)
- A new plan for Year 2 was created (see Section 3)

# 2. Data for Defining Learning Opportunities

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To avoid only generating a "Yellow Pages" of learning opportunities, the ecosystem needs to be understood in regard to who connects to whom, and why learning opportunities are valuable. Therefore, the ecosystem needs to be mapped out in regard to:

- The involved ecosystem participants and their characteristics, including key customers and key business partners of private entities.
- Lasting cooperation between the ecosystem participants. Research projects involving several of the ecosystem participants were initially chosen as the basis for this, but other types of cooperation might be used in the future.
- The existing learning opportunities.
- The motivation for engaging with the learning opportunities.

# 2.1 Involved Ecosystem Participants

The ecosystem participants will be mapped based on:

- ID / Name
- Primary Category
- DIH
- Country
- City
- Description (URL, Contact Details, etc.)
- Reputation for innovativeness
- Network Type (only if Category is Network)
- Key Customers
- Key Business Partners
- Key Sponsor

# 2.2 Research Projects

Research projects from the last 5 years will be used to map the networks in the ecosystem, based on:

- ID / Name of Participants
- Project Leader ID / Name
- Project Area
- Description (Name, Length, URL, etc.)

# 2.3 Learning Opportunities

Learning opportunities will be mapped based on:

- ID / Name of Provider
- ID / Name
- Description (URL, Contact Details, etc.)
- Importance (To whom, and why)

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# 3. Activities in Year 2, January 2019 – August 2019

The following activities were conducted during Year 2. We have hosted a number of online meetings combined with separate meetings to coach individual partners.

# 3.1 Initial dataset and Analyses

The DIH partners provided an initial data set for the information requested at the end of January after iterating with their ecosystem contacts.

Task 6.1 task force met to align on further data gathering.

# 3.2 Tuning and understanding the dataset

Task 6.1 task force gathered a final set of data for Year 2. Blumorpho were involved to make sure that we are in line with the expectations from Task 6.3 (DIH sustainability).

The following steps have been taken;

- 1. Investigate the ecosystem
- 2. Understand relationships
- 3. Understand learning opportunities and their motivation
- 4. Create network maps

The activities stated above were carried out by partners in Germany, France, Spain, Sweden and UK. The work resulted in the following numbers of collected data;

- 500 key players (relevant to the FED4SAE domain) in the EU eco-system defined
- 50 Learning opportunities defined

## 3.3 Network maps and conclusions

Based on collected data network maps were created to visualize existing structures and relations. The colour of the circle/dot indicates the type of partner/organization. In the diagram with both preparatory and continued learning, the colour of the line indicates the type of the learning opportunity. The arrow at the end of the line indicates in which direction the learning is delivered, i.e., from whom to whom.

## Analysis of the Learning Opportunities in the FED4SAE Ecosystem

These are the initial conclusions and findings;

- 1. Learning opportunities need to be divided into Preparatory and Continued Education to give a better understanding
- 2. Preparatory training is provided by Academic partners, who are deeply rooted within our "Knowledge Ecosystem". Academic partners are, however, not that well represented in Continued Education.
- 3. Continued Education can be divided into two varieties: internal within the Corporate partners and external ones provided by companies that are not significantly linked to our ecosystems. There are also closed "Members Only" initiatives that play an important role in the ecosystem but they are of course not open to anyone.

- 4. One conclusion is that it is difficult for academic partners to define courses that SMEs will find interesting.
- 5. New approaches are needed, either to broaden the ecosystems or broaden what is offered in our ecosystem.

Central players in the ecosystem, often academics or research institutes, have a strong position regarding preparatory training but are often lagging behind on Continued Education. This is an opportunity that could be exploited in terms of an extended FED4SAE DIH Service offering.

Based on interviews, primarily with Swedish companies, it stands clear that it is time consuming and expensive to find good and relevant trainings for a broader range of the organization. There is a clearly a need for new flexible models within the ecosystem and we see that the DIH could play an important role in this regard.

# Example 1 of the Network Maps from KTH in Sweden;

Simple map of nodes in the KTH eco-system



The diagram above indicates a first set of simple business relationships. Since Business oriented relationships haven't been prioritized during this task, most of the nodes are not connected in this view. In reality, this is a much more complex picture.

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## Diagram showing Preparatory learning relationships



When we apply the learning relationships filter, we start to see a better picture of what the ecosystem looks like.

Node nr 6 is a Research Centre on smart transportation and they have several relationships to both public and private players. You could say that they are a natural player in the ecosystem. Node nr 83 is Daimler, a private player that is well connected to both private and academic players. This is an interesting partner to keep track of and potentially engage with as a DIH. The same goes for Nr 10, Bosch.

Diagram with both Preparatory and Continued learning opportunities

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In this diagram we have added continued learning relationships, represented by green lines. Thus now you start to see that other players have a role in the ecosystem.

Node nr 255 is an Academia and Industry Network offering training and educations to its members.

One of the members, node nr 222, is a large Swedish consultancy firm that do a lot of internal education but that also utilize external companies for fulfilling its learning needs.

The Network Maps together with the gathered data make it possible to answer different questions like:

- Who are the important players that keep the network together?
- Where do you find intersections between academia, research and industry?
- What are the key learning opportunities and how are they utilized?
- What learning opportunities are missing?
- Are there existing learning opportunities that could be offered to others?

#### **Example 2 of the Network Maps from fortiss in Germany;**

Simple map of nodes in the fortiss eco-system

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Diagram showing learning relationships



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#### Diagram with both Preparatory and Continued learning opportunities

The German ecosystem have a good balance between private players (like node nr 17 KUKA and node nr 75 ST Microelectronics), Networks (like **node nr** 7 EIT Digital) and Research/Academic (like node nr 1 fortiss and nr 3 LMU) players that provide important learning opportunities.

# Example 3 of the Network Maps from UNICAN in Spain;

Diagram showing Preparatory learning relationships



In this ecosystem you can see that there are a couple of strong players. It is interesting that Node nr 16 is connected to a large number of networks. While node nr 24 is a private player with several connections with academic nodes.

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#### Diagram with both Preparatory and Continued learning opportunities

In this network one can see that the academic node nr 1 Unican plays a key role in providing training to a number of private players. It could be of interest to understand more about what makes those trainings so important. Could that be something for other players to pick-up?

## 3.4 Third Party Interviews

KTH have interviewed participants in FED4SAE ecosystem to validate their results. A survey has been sent out to granted Application Experiments to gather additional input from Start-ups/Scaleups.

This activity needs to be rerun again to get a better response rate. What already stands clear is that none of the responding SMEs look for help and support from academic players in the ecosystem. This is an opportunity for future DIH activities.

## 4.Year 3 Perspectives

The next step would be to outline the opportunities for encouraging collaboration within the FED4SAE eco-system during Year 3. KTH will provide an initial suggestion for a plan that will address the following areas;

- Aggregation of gathered data to be provided to other WPs
- Provide analyses and conclusions to other WPs
- Define potential data to be added to the data set (synchronized with the task on Hub Sustainability)
- Extended Survey to Application Experiments, non-funded applicants and Partners
- Align with Exploration task for leveraging collected data