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Interim report on hub sustainability

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## Executive summary

This deliverable is a preliminary report on the work done within the FED4SAE consortium in order to “establish the basis for the long-term sustainability of FED4SAE centers as CPS and Embedded System DIHs and to discuss and assess potential business models for FED4SAE innovation hubs and initiate collaborations with local innovation organisations”.

In order to identify to which condition the FED4SAE network of Digital Innovation Hubs (DIHs) could become a sustainable network, a concertation process has been set-up within the consortium first and then with external innovation stakeholders.

From this consultation process, a few conclusions can be drafted that will support further the upcoming work on the conditions of a sustainable FED4SAE DIH of DIHs.

- There is a strong willingness of all consortium partners to keep the network active in order to support SMEs in their digital transformation and adoption of CPS solutions. This supposed to be able to implement cascade funding.
- Some discussions started with private investors interested in investing in hardware solutions and perfectly aware of the related challenges to explore to which extend they could contribute to such a project.
- The growing awareness of local authorities on the need for them to support and strengthen European digitisation policies with their own programme could create opportunities to work further on cross-regional and pan-European cooperations.
- The first success stories of the companies having benefited from FED4SAE’s support will provide new opportunities to highlight the added value of this acceleration programme and the differentiation potential of CPS solutions.
- The first experiments going on in the framework of the project without any further European funding can be considered as a test for all the consortium and should provide many important inputs for the future operational mode of a sustainable network.

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## 1 Objective and Methodology

This task main objectives are:

- to establish the basis for the long-term sustainability of FED4SAE centers as CPS and Embedded System DIHs;
- to discuss and assess potential business models for FED4SAE innovation hubs and initiate collaborations with local innovation organisations.

To reach those objectives, several activities have been foreseen:


- make the best of inputs from tasks 6.1 and 6.2 inputs to develop an analysis of the specific needs and sustainability requirements of each FED4SAE centre;
- develop and validate collaboration models for services of FED4SAE hubs that can be sustained in cooperation with other local organisations;
- assess other potential funding sources or revenue streams for further services of FED4SAE hubs, such as access to the hubs' eco-systems and matchmaking/brokering services, or learning and training programmes
- trigger cross-fertilization exchanges of local actions in order to extend local Third party support with European cross-border actions
- promote FED4SAE experiment success stories to regional and national innovation programmes and investors to demonstrate the added value of cross-border collaborations and to raise interest in implementing similar schemes

The work on the FED4SAE sustainability has been designed considering two first starting points. The first one being that sustainability will result from many various interactions between numerous partners and, first of all, between members of the consortium. This means that in order to reach the FED4SAE sustainability, it is first mandatory to build a common vision between members of the consortium to be able to then build a strategic action plan. The second is that to be able to set up an up-and-running hub requires more than a founding consortium. This mean that FED4SAE reflection process on sustainability must take into account the other innovation stakeholders active in the ecosystem and the feedback of the beneficiaries of the acceleration programme.

In order to achieve the activities related to this task and to identify the challenges that a sustainable FED4SAE would have to address, two main actions have been undertaken:

- The organisation of a collaborative workshop, in Munich in March 2018, to raise discussion between partners on their vision of:
  - the ecosystem they want to build within the wider European Commission's set of policies in favour of the digital transformation;
  - the unique value-proposition of FED4SAE in such a context.
- The analysis of the current CPS innovation ecosystem done by BLUMORPHO who gathered feedbacks from innovation key actors and stakeholders through interviews.

By doing so, FED4SAE has identified the main sustainability challenges that the consortium has to address and that are reported in this provisional working paper.

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## 2 Achievements

### 2.1 Consensus and commitment from FED4SAE partners: 1<sup>st</sup> workshop on Sustainability, Munich, March 2018

Sustainability of a hub is the result of various interactions between various partners. It is thus of crucial importance to reach a consensus between all the partners involved within the FED4SAE DIH concerning their common interest to keep the ecosystem active beyond the European project and the DIH they want to develop together.

In order to start building a common vision for the future, a collaborative workshop has been organized in Munich at fortiss location, in March 2018 gathering all FED4SAE consortium members.



#### FED4SAE sustainability objectives

##### Sustainability is considered at 2 levels:

- At ecosystem level for cross border collaboration
- To provide further cascade funding and services for SMEs.

##### Combine public and private financing in:

- Encouraging the organization of local hubs in allocating specific resources to FED4SAE pan-European model
- Considering support from European Regional Funds
- Raising private financing and partnership to support the pan-European DIH network with relevant financial schemes



2017-09-26




Figure 1: The FED4SAE consortium members working on sustainability.

During this meeting, sustainability was considered at two levels:

- at the ecosystem level in order to foster cross border and pan-European collaboration;
- at the hub level in order to design an operational mode that will enable the consortium to go on providing SMSs with further cascade funding and services.

The exercise consisted in starting to answer to three main questions:

- Define what the consortium wants to achieve based on who are the members individually so they can define who they can become.
- Define what the consortium has to offer in terms of unique value proposition to the ecosystem and identify key players who benefit from its actions.
- Define how to operate this value proposition with relevant business models.

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### 2.1.1 Consensus to keep the acceleration programme up & running

The first main achievement of the workshop - and the condition to go further - had been to agree on the fact that partners had a strong common interest to maintain FED4SAE network active and were willing to lay the foundation of a sustainable acceleration programme.

This agreed, the following steps consisting in setting up the conditions of this sustainability were more complex – and still are.

The first conditions to reach sustainability are co-related to the ability of the consortium to create added value for companies, be there solutions adopters or providers and for the rest of the ecosystem. It may state the obvious but this added value will be the *condition sine qua non* to maintain the acceleration programme.

The added value created for beneficiaries will be the starting point from which the hub will be able to further combine public and private financing and:


- Encourage the organization of local hubs in allocating specific resources to FED4SAE pan-European model;
- Raise private financing and partnership to support the pan-European DIH network with relevant financial schemes;
- Consider support from European Regional Funds.

### 2.1.2 Analyse of FED4SAE's added-value for their beneficiaries

Considering the added value created by FED4SAE, one important result of the workshop was that all partners agreed on the fact that start-ups and SMES are not the only stakeholders benefiting from the acceleration programme. FED4SAE sustainability engages not only members of the consortium and beneficiaries but other players acting in the innovation ecosystem who will be interested in the co-funding of FED4SAE actions.

During the workshop, partners analysed the added value of FED4SAE activities for major ecosystem stakeholders and how it should convince them to join the sustainable hub.

- Benefits for Academic/researchers
  - Be part of a unique Pan European experts network - **international recognition**
  - Gain in visibility to attract **new competencies** in public research
  - Discuss with peers **to address common challenges**
  - Define attractive **roadmap** towards state of the art technologies addressing industrial challenges
  - **Attract investment** in public research programs
- Benefits for Industrial players
  - **Providers of components**: Marketing of their solution, identification of new potential markets, Customers experience (MARKETING)
  - **Potential users of CPS solutions**: identify potential new suppliers of new solutions (BROKERAGE) in their fields of activities on specific challenges –
- Benefits for National and Regional DIHs
  - Benefit from specific expertise in CPS and Embedded Systems at European level to combine with local expertise

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- Match local activities at application level with new functions brought by CPS and Embedded systems for the benefits of local players
- Share resources and access to European infrastructure to reduce investment when possible
- Combine activities for Pan European actions and related funding sources – possible co-funding.
- Benefit for the European Commission
  - Strengthen a leading industrial position and enabling the development of innovative solutions at European level to address digitization challenges
  - Overcome regional fragmentation
- Benefits for the VCs/ investors and Banks
  - Make Europe a fertile environment for promising start ups to invest in with attractive maturity, differentiation and attractive markets
  - Acknowledge that investors are investing in companies, not in ecosystems

This first work on what could be the benefits of a sustainable FED4SAE ecosystem for the innovation stakeholders still need to be further explored and validated on the long term. However, it was a first important step in the collective awareness that the European SMEs are not the only beneficiaries of the European Innovation Actions and that sustainability requires a global reflection process.

This workshop reached the objective to have a joint interest and commitment to further maintain FED4SAE activities and grow the network.

Different types of actions to generate financial sustainability of FED4SAE have been suggested as illustrated in figure 2.

- Membership

FED4SAE aims at being the best European network of stakeholders active in Cyber Physical Systems and its related technologies. Belonging to this “Club” should be considered as a label of excellence. We are thus considering a membership fee to join this unique ecosystem.

- Training as a Service

During the workshop, the added-value of FED4SAE for technology providers to promote their solutions and encourage their adoption has been clearly highlighted as a “MARKETING ASSETS”.


FED4SAE members would like thus to consider Training as a Service to further promote the adoption of CPS in the European ecosystem. We will consider both technical and business education. The business model to further sustain FED4SAE with those activities has to be further assessed. We considered marketing investment from technology providers and education investment at regional level or directly by companies participating to the training. It will have to be further assessed.

- Regional and Private Co-Funding

FED4SAE is by designed a European network with a European impact. We would like to further investigate on how regional agencies could financial support FED4SAE activities especially the co funding of Application Experiments.

The same question has been raised related to private funding. We agreed that it will be important to deep dive into such co-funding strategy by interviewing targeted stakeholders: regional and local agencies as well as private players.



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In any case, while driving the workshop and assessing the challenges and expectations of the different stakeholders we could consider to further support the sustainability of FED4SAE, we noticed that Pan European collaboration are not yet “natural” and are especially supported and driven by the European Commission. The European added value is one of the major challenge FED4SAE wants to reach and further promote.

## Towards sustainability

### Different business models will have to be combined



Figure 2- FED4SAE sustainability workshop first results


### 2.2 Towards the involvement of the whole ecosystem – interviews

In line with the first result of the workshop and in order to create synergies between FED4SAE work on sustainability and the global dynamic generated by the European Commission concerning the development of DIHs, some discussions have started with key innovation stakeholders:

- Public and private investors;
- Regional agencies;
- National initiatives in charge of Industry 4.0 in their respective countries.

It is here important to notice that from 2017 when FED4SAE has been launched, till now, the doctrine of the European Commission on DIHs has slightly evolved. Consequently, the perception of the



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challenges at stake by the various stakeholders that enter into such a discussion must have evolved also in the recent months. The announcement of the Digital Europe Programme in 2018 must have had also a significant impact on the perception of those challenges by external actors by highlighting how important the digital transformation is for the European Commission.

- **National and regional authorities**

This is especially the case when speaking about public stakeholders. In early 2018, most of the local authorities were not all sufficiently aware or convinced of the digitisation expected benefits, not all aware of or engaged in the DIHs strategy and still very focused on their local/national ecosystems. Most of them are now surely, if not clearly convinced, at least clearly aware of the European Commission policy in favour of DIHs. The awareness of the expected benefit of a pan European cooperation to foster the digitalisation of the European ecosystem has undoubtedly raised during the last year.

However, whatever strong their new conviction is, there are some remaining questions:


- How to position innovation accelerators, Clusters and smart specialisation strategies within the global DIHs ecosystem to avoid overlapping structures and policies and reduce the fragmentation of the European ecosystem?
- How to create real synergies between European and regional/local funding?
- To which condition could a thematic/sectorial DIH as FED4SAE reach sustainability and collaborate with regional ecosystem beyond the life of the European project funded under H2020?

In order to further assess FED4SAE sustainability, members of the FED4SAE consortium started to engage discussions with organizations like Region Auvergne-Rhône-Alpes (France), North east LEP (UK), Ministry of economic development and technology and DIH of Slovenia. They all expressed interest in FEDSAE continuity and the most likely model for their support is some co-funding for Pan European collaborations.

- **Public and private investors**

As stated previously, private investors usually invest in companies and not in ecosystems. However, some private investors are willing to invest in specific technologies either by building dedicated Fund, provided that others publics investors are also involved in the process or by becoming a member of a community.

- This is the case for example of Chrysalix Venture Capital, an industrial innovation venture capital firm who created the *Chrysalix RoboValley Fund* in partnership with the RoboValley Cluster and the Delft University of technology in 2018. This Fund is expected to invest in early-stage companies that are developing technologies in robotics, intelligent systems and resource productivity solutions for industries such as energy, mining, mobility, chemicals and materials.
- The INPHO Venture Forum which held its 6<sup>th</sup> edition in 2018 or the European Photonics Venture Forum set-up in 2015 provide other examples of investors involvement in a technological community in order to try to fill the gap of access to finance for European companies compare to the US or Asian companies. By meeting every year or every two years, those forums bring together those who can accelerate the development of better equity and debt vehicles with entrepreneurs in cutting-edge technologies.

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Although those first experiences are quite new, they can proud themselves of an already significant impact in their respective domains<sup>1</sup>. The opportunity to work closer with investors is interesting to explore further. That is why discussions have started with a selected team of private investors members of BLUMORPHO network. Active in the Hardware business and aware of its challenges, it seemed appropriate to start the discussion with them to gather their inputs on such a collaboration.

Jean-Gabriel	Boinot-Tramoni	Partner	Quantonation
George	UGRAS	Managing Director	AV8 Ventures
Dieter	KRAFT	General Manager	Trumpf Ventures
Christian	REITBERGER	Partner	BtoV
Aymerik	RENARD	General Partner	Hardware Club
Paul	THURK	Managing Director	Arch Venture Partners
Christophe	DESRUMAUX	Investment Director	Super Nova Invest
Cédric	FAVIER	Investment Director	Elaia Partners
Augustin	Sayer	Partner	NEWFUND
Clément	Vanden Driessche	Partner	Next47
Uhl	Heribert	Partner	Robert Bosch Venture
François	Tison	General Partner	360 Capital Partners
Cyril	GILBERT	Partner	Jolt Capital
Jean-Louis	Malinge	Partner	ARCH Venture Partners

During the last INPHO Venture Forum which took place in 2018, those private investors were introduced to FED4SAE project and the Smart Anything Everywhere initiative. The best way to promote FED4SAE activities were to showcase the work undertaken by this acceleration program. Consequently, two companies involved in CPS projects have been invited to pitch in front of those investors. The company GLANTA-SUREWASH, selected in the frame of the first call of FED4SAE, and Global Sensing Technology involved in EuroCPS have been able to present their investment opportunity to the panel of investors with an emphasis on the support received by FEDSAE and the EC.


Additional investment companies such as Brain to Venture and Super Nova Invest also expressed their interested to further discuss with us the investment opportunities in the industry segment. The company Alibaba Cloud also offered the possibility to meet with the FED4SAE supported companies to study with them the possibility of a free access to Cloud solutions.

Investors expressed their interest in exploring further some possible collaboration while considering possible investment in supported companies.

However, the development of the companies benefitting from FED4SAE acceleration programme do not necessarily require the involvement of private investors. Sometime, public loans and equity free solutions are more appropriate. It is thus very important that banks are also identified and targeted in further discussions towards the access to finance of innovative companies. In the framework of the 6<sup>th</sup> edition of the INPHO Venture Forum, a workshop was organised by BLUMORPHO in order to allow innovative companies and private investors to meet with experts of the European Commission and the

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<sup>1</sup> Now in its sixth edition, INPHO® has attracted more than 800 European participants, 100 international keynote speakers and over 150 VCs and corporate funds. More than 110 start-ups have been selected to pitch, raising more than 200 M€.

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EIB. The aim of this workshop was on the one side, to raise awareness of innovative companies about the solutions the EU Innov'Fin programme could provide them with in their challenge of accessing appropriate growth financing tools. On the other side, the aim of the workshop was to raise awareness of the European Commission and EIB teams on the remaining weaknesses of the European banking network concerning the provision of appropriate financing solutions to innovative companies.

Those first actions taken in order to raise awareness of private investors on CPS solutions potential and on the role of FED4SAE programme on the one hand and to help innovative companies in their understanding of private investors constraints on the other hand will be further developed in the coming months.

In addition, and since engaging relationship with private investors does not only rely on investing as a shareholder but also as a business partner, we started engaging discussions with with major players like BOSCH, TRUMPF, General Electric, John Deere, Newable, Sellafield ...to define relevant business model for collaboration. They expressed interest to deep dive on how to collaborate but co-funding is the most likely option.


### **3 Possible ways towards sustainability**

#### **3.1 Possible business models**

To strengthen the structure of FEDSAE ecosystem, some first solutions have been foreseen. Various business models will have to be combined depending on the services provided by the hubs. The first suggestions done during the collaborative workshop organized in March 2018 at fortiss location in Munich have been strengthened through direct interactions with stakeholders.

We can summarize hereafter the main orientations we are considering to sustain FED4SAE activities in combining the following business models:

- FED4SAE sustainable structure could be organised as a « Club » - it could be an Alliance or an Association with membership fees. Many partners of the consortium cannot take stronger participation in another organisation that would be legally binding. The association seems the easiest solution to be implemented for now. However, the amount of a possible membership fee has not been discussed yet and they will have to be tested also directly at the FED4SAE partners' levels. This action is to be taken in the upcoming period.
- Organization of Training As A Service: the development and the adoption of CPS solutions requires very qualified workers. Training should become another major task of the consortium. Lifelong learning courses should be an important complementary source of funding for the network. However, knowing to which extent those services could contribute to the global FED4SAE budget has not been discussed yet. We will consider launching such a service in the 2020 to test it in real conditions.
- Organization of brokerage activities should also be a target such as a relevant business models for such a service since it also involves possible marketing budget of shareholders. The process will be assessed.

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- The involvement of the supported companies in the sustainability of the network is also still in discussion. If the pay-back model *stricto sensu* cannot be further explored, there is still a stringent need for solutions that could incentivise the consortium in the selection of the most promising use cases and incentivise the companies in entering and contributing to the FED4SAE community.

It is here important to notice that although no figure or amount has already been introduced in the discussion, the required budget to further provide cascade funding and enabling the adoption of CPS solution in the European industry will be the next step to agree on to get a clearer idea of what the challenge is.

In this respect, it is interesting to have a careful watch on the application experiment that has been endorsed by one partner of the consortium on their own budget. The interest of such an experimentation is twofold. First of all, it demonstrates, if necessary, the strong motivation of members of the consortium to keep the network active and to further support innovative projects beyond the European funding. This strong involvement of FED4SAE partners also demonstrates the need for further funding to facilitate the adoption and development of CPS solutions which otherwise would have been less likely to successfully get closer to the market.

Moreover, this first experiment will provide additional information to draft a provisional strategic plan & budget for a sustainable FED4SAE providing one new example of how a competence centre or a DIH can invest their own human and financial resources in a project they believe in and are interested in.


However, although FED4SAE partners have expressed a strong willingness to find solutions to gain in autonomy vis-à-vis the public funding, it seems to many stakeholders that such support to the dissemination of innovative solutions within the European companies will still, in a way or another, require a significant part of public finding.

### 3.2 Next steps

The sustainability of FED4SAE network supposes to not only highlight the added value generated by the acceleration programme but to be able to evaluate the cost/price of this added value. Having a clear idea of the required budget to keep the network up and running and of who could pay for it will be the next steps in this reflection process.

The first success stories of companies having benefiting from FED4SAE acceleration programme will also provide some interesting feedbacks to the consortium on the added value generated by their collaboration and the strong differentiation opportunities they can provide to business developers. Beyond the consortium members, the added value thus generated will also provide further argument in the discussion with innovation stakeholders that need to be involved in the sustainability of the network.

Furthermore, there is a discussion going on within the Smart Anything Everywhere initiative finishing CSA, Smart4Europe, on the sustainability of the network of SAE Innovations Actions. This work is very interesting for the FED4SAE consortium as it would be a way to benefit from the strength of a wider team, a wider network, and to create synergies on some of the assets of the SAE initiative. The upcoming CSA will probably build on the work previously done and FED4SAE has already expressed its willingness to cooperate with the CSA and other Innovation actions in that sense.

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## 4 Conclusion

At the current stage of the FED4SAE project, the first achievements concerning the reflection on the requirements for the setting-up of a sustainable network can be listed as follows:

- There is a strong willingness of all consortium partners to keep the network active to provide cascade funding to support SMEs in their digital transformation and adoption of CPS solutions.
- Some discussions started with private investors interested in investing in hardware solutions and perfectly aware of the related challenges to explore further the opportunity of their involvement in the FED4SAE community.
- The growing awareness of local authorities of the need for them to support and strengthen European digitisation policies with their own programme could provide some opportunities to work further on cross-regional and pan-European cooperation.
- The first success stories of the companies having benefited from FED4SAE support will provide new opportunities to highlight the added value of this acceleration programme and the differentiation potential of CPS solutions.
- The first experiments going on in the framework of the project without any further European funding can be considered as a test for all the consortium and should provide many important inputs for the future operational mode of a sustainable network.

However, the critical part of the sustainability and the financial discussion are still ahead of us. It seems indeed that to continue to support the wider spread of innovative solutions within European companies will, in a way or another, require a significant part of public finding. The coordination set-up within the Smart Anything Everywhere initiative with others Innovation Actions may be of help in this challenging process.