Smart connectivity testbeds use by DIHs

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SCoDIHNet and WG Testing and Experimentation Environments WG

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Executive Summary

The paper has the objective to help the Smart Connectivity Digital Innovation Hub Network members to find experimental facilities closed to their location in order to develop and experiment innovative use cases for end users.

A number of European funded projects have put in place experimental facilities all over Europe with the most advanced digital technologies, it is an opportunity for DIH to use them and to push the digitalisation of the European Industry.

However, each experimental platforms are managed by organisations that could have specific policies with regards to access modalities. It will be up to DIH to deal this when choosing the experimental facilities.

Experimental facilities are also addressing verticals with specificities, DIH will also have to check this specialisation with regards to the use cases that there are willing to develop.

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Introduction

This paper has the objective to provide an overview of the Smart Connectivity testing facilities available in Europe and funded by different programs.

It provides also indications on how to use them or to access to them remotely with a specific focus on DIHs.

Finaly, with regards to the existing operation, it provides some recommendations for the future in order to bring a better service to DIHs.

"Test before invest" is one of the key objectives of DIHs and there is a need to help them to access to the existing experimental facilities to fulfil this goal. Testing and experimental facilities operation has a cost that is difficult to be supported by single organisations, some of them are supported by funded projects but the lifetime is limited which makes difficult long-term sustainability.

1. Panorama of Smart Connectivity testing facilities

1.1. Smart Connectivity Experimental platforms catalogue

The Smart Connectivity DIH networks has develop a catalogue of experimental platforms in order to help DIHs to know where they are located and what services they are offering. DIHs are already using commercial platforms but they are also looking after research and innovation facilities to develop innovative use cases and solutions for end users.

The catalogue is encompassing the following Smart Connectivity platforms

- DIH commercial
- 5G PPP experimental platforms
- SNS JU Stream C
- CEF 5G for Smart Connectivity
- CEF 5G Corridors
- AIOTI test beds
- Testing European Facilities

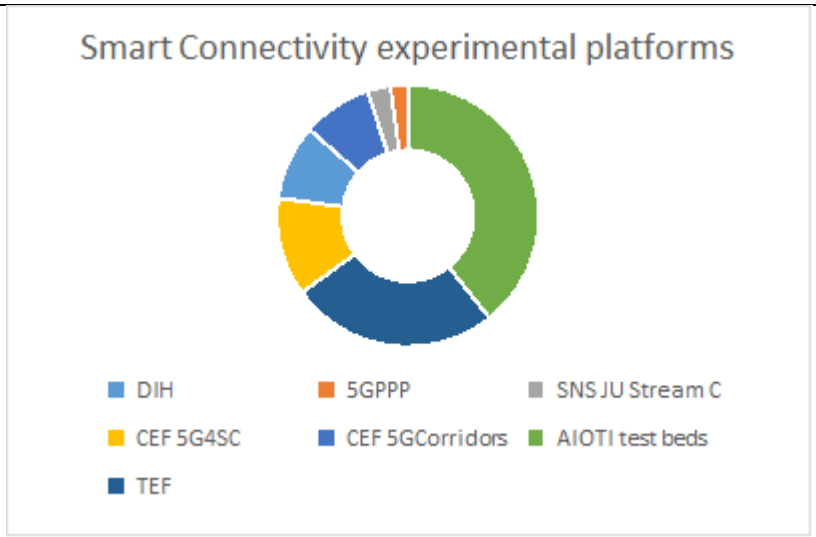

Figure 1: Smart Connectivity experimental platforms panorama

It includes the following information:

- Platform brand name
- Description
- Field of Applications
- Project domain
- Organisation
- Street Address
- City
- Country
- Access modalities
- Contact name
- Contact email
- Website

There are several types of platforms:

- Research and innovation platforms mostly developed under European funded projects, they are usually located in research and innovation laboratories
- Experimental facilities offering precommercial solutions and deployed in real condition
- Commercial platforms operated by DIHs or private companies

1.2. Verticals

The Testing European Facilities are mainly targeting verticals (Agrifood, Manufacturing, Smart cities and Health), but they are using smart connectivity enablers in order to provide an end 2 end service. They are implemented in real situation (fields/farms, Industry plans, Cities, hospitals) and are open to DIH which are willing to develop use cases for end users.

The field of application is quite large, they are covering the following domains IoT/IIoT, 5G/6G, Healthcare, Smart Cities/Smart Buildings, Agrifood, Manufacturing, Smart Port, Public Safety/PPDR, Education, Energy/Smart Grid, Transport/Logistics, Mobility/Automotive, Space, Society, Smart Tourism, Water quality, Communities.

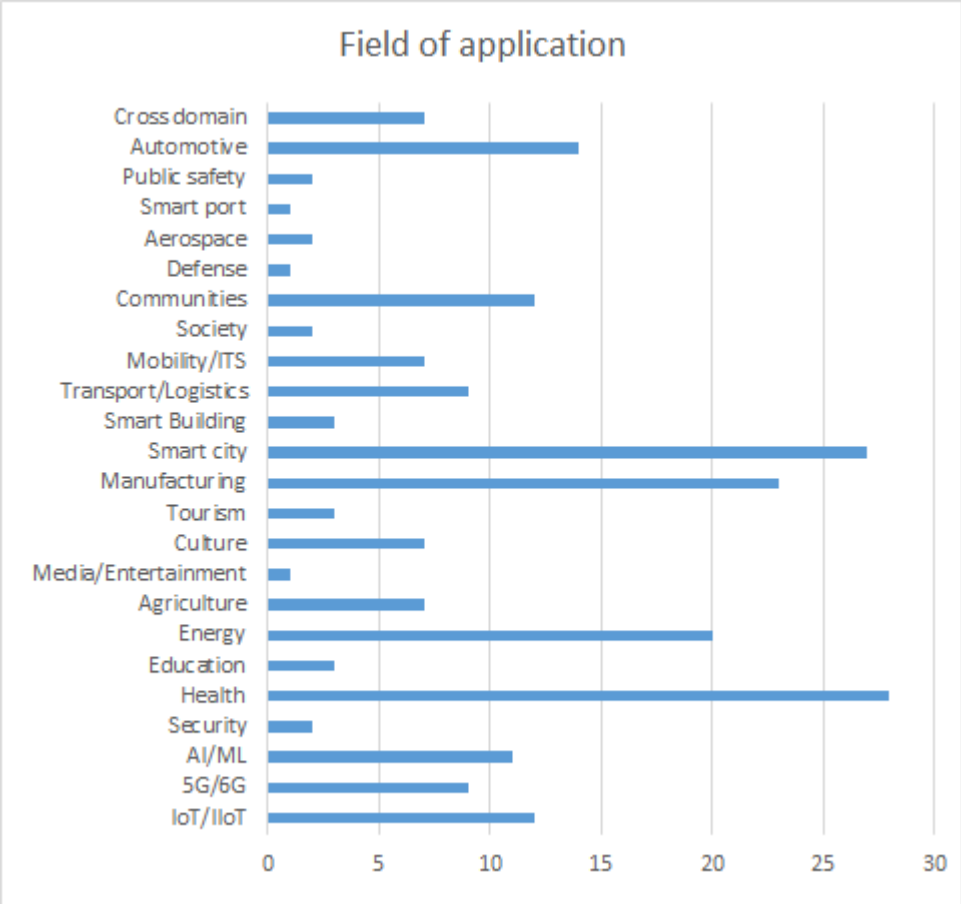

Figure 2: Field of application

1.3. Location

Most of these platforms are open to anyone but under conditions that have to be negotiated with the owners. Some are accessible remotely; some need to be used onsite, it why we have located each of these platforms on a map in order to help DIH to find the most relevant experimental facilities.

Looking to the map above, it happens that these platforms are not well distributed among Europe, there is place for improvement.

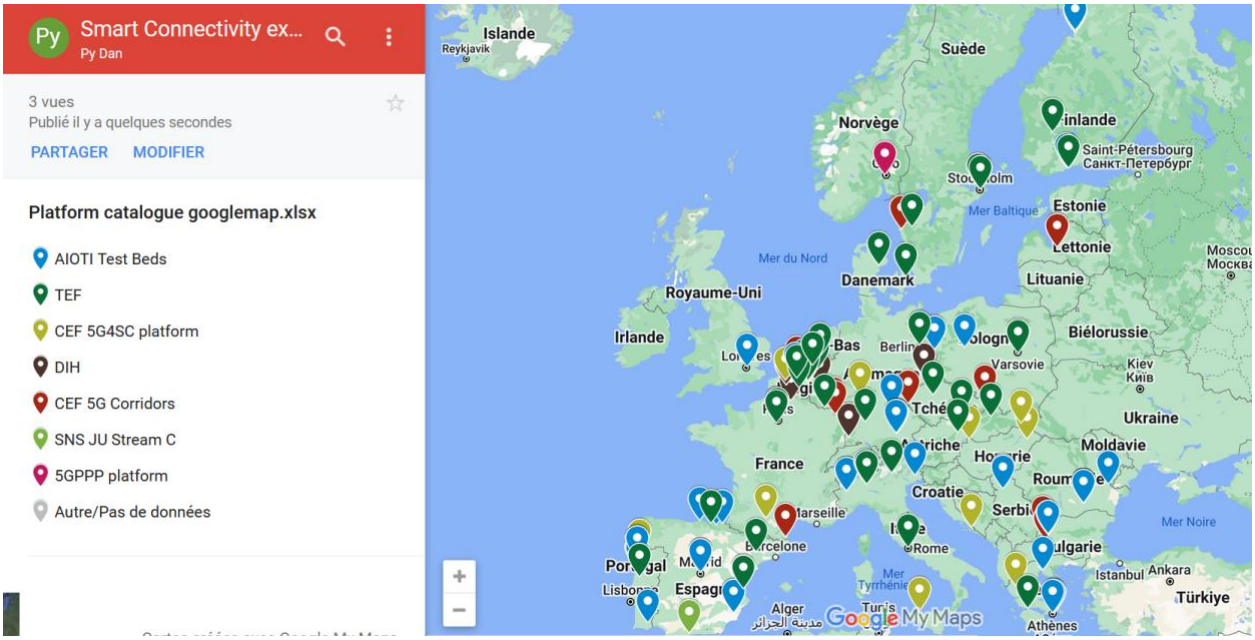

Figure 3: Smart connectivity experimental platform map

1.4 Operation costs

The operation, maintenance and update of these platforms have a cost and it is sometimes difficult for owners to support these costs after the end of the funding period. In order to offer a good service, there is a need to keep a team able to support the platforms and to help users. After the end of a project, the platforms are usually operated in best-effort mode.

There are two main types of organisations:

- Experimental facilities that are operated by a consortium supported by public funds, have difficulties flying alone without funding after the end of the project
- Testbeds, which are operated by a single organisation (AIOTI test beds) are usually used for several projects in which the organisation is involved and is using several sources of public funds. These are more sustainable if the owner is involved in collaborative projects.

The question of Post-Project sustainability is crucial to providing best-in-class testing and experimentation facilities to DIH in the long term. At the end of the funding period, most of the projects are closing their facilities or are operating them in a best effort, which is not guaranteeing a best-in-class service.

2. Access modalities to DIHs

European Digital Innovation Hubs (EDIHs) are demand-driven one-stop shops supporting companies (especially SMEs) and public sector organisations in their digitalisation journey, for free or at a discounted price.

DIHs have the objectives to propose to end user's innovative digital solutions' able to help industry to become more competitive. For that purpose, they need to find the most advanced technologies and to develop use cases on top of enabling technologies such as AI or Smart Connectivity, security, big data, …

Another DIH objective is "Test before invest", The Test Before Invest services include various types of offerings to give companies the opportunity to experience firsthand the benefits that technology can provide before embarking on a digitalization journey. This begins with a minimal investment and gradually moves towards more significant interventions after evaluating the results.

Companies interested in specific technologies can access the technologies and know-how available in the laboratories for experiments, trials, demos, feasibility studies, and prototype developments.

For that purpose, they need to test and experiment these use cases on existing experimental facilities that are available with best in class enabling technologies.

Most of these platforms are operated by technology providers, they could be private or supported by funding projects. In any case, there is a need to negotiate the access to these platforms (on site or remotely).

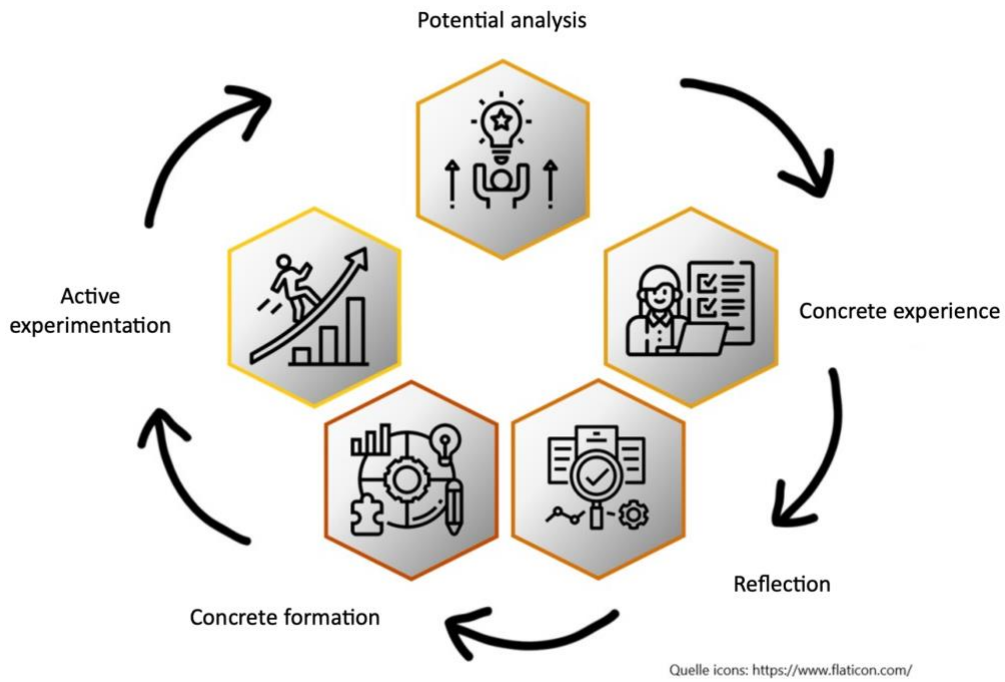

Figure 4: Test Before Invest concept: David Kolb's "Experimental Learning" approach

3. Recommendations

In the current situation, there is a multiplicity of test platforms and experimental facilities, which is suboptimal and leads to fragmentation to which the programmes are contributing.

There are a number of European funding programs which supports the development of smart connectivity testing facilities (Horizon Europe cluster 4, Smart Networks and Services Joint undertaking, Digital Europe Programme, Connecting Europe Facility, Testing and Experimentation Facilities). Therefore, there is a need to align all programs to avoid overlaps through a global coordination but also to cover homogeneously the whole Europe since EDIHs has been chosen.

Another aspect is the sustainability of these platforms after the end of the support of funding projects. A number of them are closing and they are running in best effort with a very limited level of service. How can EU-funded projects continue to create impact beyond their initial funding period? This question needs to be addressed to solution provided in order to provide best in class testing and experimental facilities to DIH.

The region's Smart Specialisation could be used to build such a network of European experimental facilities taking advantage of the regional specificities.

A more strategic approach for the next European Framework Research programme should target a limited number of platforms with clear objectives and clear governance to avoid overlaps and fragmentation and focus efforts and funding.

References

AIOTI Online Testbeds Catalogue

SNS JU experimental platforms (Stream C)

5G PPP platforms

CEF 5G for Smart community platforms:

- Call 1 projects
- Call 2 projects
- Call 3 projects

CEF 5G Corridors

Testing and Experimentation Facilities

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Acknowledgements

About AIOTI

AIOTI is the multi-stakeholder platform for stimulating AI, IoT and Edge Continuum Innovation in Europe, bringing together small and large companies, academia, researchers, policy makers, end-users and representatives of society in an end-to-end approach. We strive to leverage, share and promote best practices in the AI, IoT and Edge Continuum ecosystems, be a one-stop point of information to our members while proactively addressing key issues and roadblocks for economic growth, acceptance and adoption of the AI, IoT and Edge Continuum Innovation in society. AIOTI contributions goes beyond technology and addresses horizontal elements across application domains, such as matchmaking and stimulating cooperation by creating joint research roadmaps, defining policies and driving convergence of standards and interoperability.

About SNS CO-OP

The SNS Co-Op project supports and coordinates the European Smart Networks and Services Joint Undertaking (SNS JU) community, ensuring the integration of current and future phases of its activities. With the SNS Initiative set to grow to around R&I 80 projects, SNS Co-Op provides essential programme coordination, strategic activity orchestration, and community engagement to advance 6G innovation.

The project builds on the strengths of previous initiatives (SNS OPS, SNS ICE, and 6GStart), facilitating stakeholder collaboration, engagement with vertical industry domains, strategic positioning, facilitation of standardisation activities, and alignment within the broader European and global 6G ecosystem. It also promotes the accomplishments of the SNS JU programme in international fora such as the EUCNC & 6G Summit and Techritory Forum.