Advanced Technologies for Industry

Moving from technology-based networks to value chain-based networks: How to improve the effectiveness of cross-border networks of ATI technology centres in the field of Smart Health?

Online workshop

4 March 2021, 9:00 – 12:30, Zoom

Organised on behalf of:
European Commission DG GROW
Executive Agency for Small and Medium sized Enterprises, EASME
by Technopolis Group and IDEA Consult

The workshop on 'Moving from technology-based networks to value chain-based networks: How to improve the effectiveness of cross-border networks of ATI technology centres in the field of Smart Health? ' was the fourth in a series of 4 policy seminars organised within the Advanced Technologies for Industry (ATI) project (https://ati.ec.europa.eu) commissioned by the Executive Agency for Small and Medium-Sized Enterprises and the European Commission DG GROW.

The objective of this webinar was to gather insights and recommendations for future networks of technology centres providing services to companies (SMEs) in the field of smart health. The event focused on how networks of technology centres can be more effective in satisfying the needs of SMEs and healthcare institutions in the field of smart health by implementing a value chain approach, being more reactive to market needs. It also discussed how to better connect smart health related knowledge, scale up existing pan-European networks and build more synergies among existing actions.

ATI Technology Centres are defined as public or private organisations carrying out applied research and close-to-market innovation (Technology Readiness Levels TRL 3 to 8, including at least one TRL >5) in Advanced Technologies (AT). The concept of networks of ATI technology centres refers to networks providing technology facilities, services and expertise to SMEs in the field of AT. These networks act as a single-entry point ("one-stop shop") for SMEs willing to get access to the technology services and facilities available from the technology centres in the network.

Agenda

9.00 – 9:05	Welcome, Evangelos Meles, European Commission DG GROW
9:05 – 9:30	Introduction to the concept of value chain-based networks. Recommendations from the "Study on Access of SMEs to ATI technological centres", Els van de Velde, IDEA Consult and Kincsö Izsak, Technopolis Group
9:30 – 10:40	Presentation of cross-border networks in the area of smart health • Françoise Charbit, European Affairs Senior Adviser CEA, EARTO, coordinator of the WG Emerging Technologies for Healthcare • Françoise Siepel, Assistant Professor, University of Twente, Operational coordinator, DIH-HERO project • Manuel Ottaviano, Senior Researcher, Technical University Madrid, Horizon 2020 project PULSE

	• Patrick Boisseau, Director General, MedTech Europe, Innovative Healthcare Initiative (potential JU to be set up) • Furio Gramatica, HealthTech4EU
10:40 – 12:15	Virtual roundtable discussion • Jacques Demotes, Director General, ECRIN • Danny Van Roijen, Digital Health Director, COCIR • Speakers & Participants
12:15 – 12:30	Conclusions and Next Steps

Key points from presentations:

1. **Welcome**

The European Commission welcomed the participants and presented briefly the Advanced Technology for Industry (ATI) project. The policy context of this project is the European New Industrial Strategy, the communication on Shaping Europe's Digital Future and the European Green Deal. The recovery from the pandemic has created an opportunity to take further steps towards a more sustainable economic model, enabled by a broader diffusion and uptake of advanced technologies. Technology centres are key actors of this diffusion.

2. **Introduction to the concept of value chain-based networks, Recommendations from the "Study on Access of SMEs to ATI technological centres"**

The online mapping of the ATI technology centres is a tool to help SMEs find available technology related services. The tool allows them to filter to the country where the technology centres are and find relevant activities. These technology centres focus on the higher TRL levels (TRL 3-8). The networks of ATI technology centres aim at offering high quality cooperation activities and industry-related services. The project recognises that there are different types of networks, either with a technological focus or a diverse organisation structure, and that they operate on different levels (regional, national or EU). The project provides a four-step procedure of the process: (1) the identification of relevant value chains in Europe; (2) the identification of stakeholders alongside these value chains; (3) the selection of technology centres that can contribute to the identified value chain; (4) and the identification of the demands and needs of stakeholders along the value chain.

Presentation of cross-border networks in the area of smart health:

European Association of Research and Technology Organisations, healthcare working group

The European Association of Research and Technology Organisations (EARTO) represents European research and technology organisations (RTOs) and provides validation, prototyping for clinical studies, upscaling services, including research to partners such as to SMEs, startups and corporates. The infrastructure has open access under contractual agreement and supports industrial value chains. They work closely with clinical centres to ensure the implementation of the right technology and takes into consideration patients' feedback in the further development of this technology.

Services for SMEs were illustrated with two examples; 1) Digital Innovation Hub focusing on additive manufacturing and 3D printing; and 2) providing a service that addresses the weak link to the clinical assessment through a clinical investigation centre at the Grenoble University Hospital in cooperation with two research institutes and an industrial alliance of manufacture.

Innovative Healthcare Initiative (potential Joint Undertaking to be set up)

MedTech Europe presented the European Partnership on Health Innovation (or Intelligent Healthcare Initiative IHI) and how it can ensure less complexity and added value. The presentation was done on behalf of five industry associations: COCIR, Efpia, Europabio, MedTech Europe and Vaccines Europe who are part of a public – private partnership (PPP) in the process of being established. To achieve more added value, purposeful integration should happen through technologies and know-how, products and services, clinical, community, social and informal care workflows, business models and convergence of frameworks.

This cross-sectoral European Health Innovation PPP is expected to push boundaries of the pre-competitive space and to mobilise and combine expertise across pharma, biotech, medtech and health IT. It strives for pioneer paradigm changes and cross-sector innovation and to strengthen the translational research ecosystem in Europe. The IHI is also expected to be aligned with the new joint undertaking on the Key Digital Technologies and other public-private partnerships with health care systems and global health.

The proposed agenda emphasises the importance of Big Data with advanced analytics/AI that is expected to enable R&D, products and services and to support an integrated healthcare approach. The objective is to promote the development of integrated care solutions centred around the patients and engage citizens in the execution of projects. A public-private partnership is being envisioned that brings ideas of health technologies and smart healthcare solutions into practice. Such partnership can include different stakeholders, such as citizens, patient carers, academia, RTOs, learned societies, research infrastructures, EU and national regulators, industries of all sectors and sizes, healthcare systems, healthcare professionals and EU Member States.

DIH-HERO project

The DIH-HERO project is coordinated by the University of Twente that focuses on healthcare robotics with the objective to support SMEs. The project is part of the Digital Innovation Hubs which are a key pillar in the European Commission's Digitising European Industry initiative. In the period of the pandemic, DIH-HERO has incentivised cross-border collaboration working mainly on robotics and supporting healthcare professionals, diagnostics robotics and robotics supporting patients.

The robotics market is expected to grow and automation technologies to become more relevant as a result of the need to improve quality of life in the times of demographic changes. Robotics is thriving, but there are also struggles and challenges on how to integrate new technology into the clinical field. DIH-HERO will facilitate and accelerate application for robotics technology for healthcare in Europe.

Their independent platform offers services for SMEs across Europe where they can apply for technology demonstrations and transfer experiments. They also connect businesses through matchmaking events and webinars. To make use of robotics, a one stop-shop for healthcare robotics is needed. In this context, standards need to be harmonised, easy access to information, expertise and services must be ensured, and financial support regarding travelling, technology demonstrators and technology transfer must be provided.

PULSE – Horizon 2020

The PULSE project was implemented under the Horizon 2020 programme and aimed at providing input on how to build a healthy ecosystem and transform public health from a reactive one to become predictive with the use of Big Data. The project promoted the empowerment of citizens through a citizen science approach using the Pulsair App and a wearable sensor. The App gathered health data that contributed to the creation of an urban health and wellbeing dataset and aimed at showing the impact of the pollution on the health status of citizens.

The project has been an opportunity to bring together small companies and startups with healthcare institutions. The role of technology centres should be to bring together actors from the technology and medical fields and public health. There are cases where SMEs operating in the field of smart health face issues to access larger corporations. A possible solution is to provide living labs as a place to help companies to validate their work and to be put in contact with other stakeholders, citizens, and professions. This is crucial to cover an existing gap in the European landscape.

HealthTech4EU

HealthTech4EU is built on a long history of collaboration among various actors. Healthcare systems are required today to offer innovative services along the continuum of the integrated care that includes prevention, diagnosis, rehabilitation, home care and long-term care. Two dimensions of these ecosystems should be considered 1) the continuation of care (where the typical healthcare system puts patient in the centre) and 2) the value chain of medical technologies from industry to research and innovation.

HealthTech4EU proposes creating a unique cross-technology platform that is complementary and supportive to cross-sectorial approach of healthcare industries along the continuum of care. In this way, a two-dimension approach will provide cross-technology inputs for research and innovation agendas of European funding programmes and support and encourage healthcare providers, RTOs and SMEs to actively participate in European calls and collaborative projects. This provides a single-entry point ('one-stop-shop') with a wide expertise from a representative community and ensures a process that is transparent, reactive, inclusive and open. The platform will ensure strategic consultation, brokerage and cross-tech solutions to be presented as an offer to meet industry demand.

European Clinical Research Infrastructure Network (ECRIN)

The European Clinical Research Infrastructure Network is a not-for-profit intergovernmental organisation that supports the conduct of multinational clinical trials in Europe. ECRIN has the legal status of a European Research Infrastructure Consortium. One of ECRIN's projects focuses on collecting all-mixed large-scale data. The data are processed by machine learning algorithms in order to identify homogeneous clusters of patients, and then to pre-clinical models to understand the treatments in the clusters. Then, clinical trials address the need for either a personalised medicine approach or a non-personalised medicine approach (taking into consideration the value-based dimension).

Discussion:

Overall expectations from networks of technology centres:

- There is a clear need to build a **cross-sectoral and cross-stakeholder consortium** to address ambitious research and innovation projects within healthcare and especially in the field of Smart Health. Different stakeholders, among other SMEs will have to work together to build synergies and develop joint tools and services. Multidisciplinary and multi-stakeholder structures should be consolidated.
- There is a **critical role for networks of technology centres due to the fact that they can be well-connected to startups and SMEs**. They can support technology development of companies and help building connections between startups and large corporates. Networks of technology centres can become 'go-betweens' for SMEs, large firms, hospitals and health care professionals.
- **Smart health solutions shall be more often demonstrated at a European scale**, where healthcare providers can test the technology in practice and startups can prove the potential outcomes. This can remove barriers and risks. It can also help create mutual understanding between the technology provider and innovators on one side, and healthcare professionals on the other side, by really understanding each other's worlds and identify real needs.
- **Value-based healthcare** should be placed in the centre. Even though the context of value-based healthcare has been implemented in some local or regional experimentations, it is not widely adopted and implemented. It is a critical priority to implement more value-based approach and procurement. Within cross-border collaborations, companies have to follow the local or regional rules. It should however be possible to find common ground.

Needs in the smart health ecosystem:

- Cross-border collaboration cannot be implemented easily since national economic models and contractual agreements are unique. National and regional healthcare systems operate often in parallel with no unique European set of rules but rather 27 uneven set of rules, reimbursements and payments. The **fragmented landscape makes it more difficult to scale up digital health/smart health solutions** and operate them successfully in different countries. The role of networks of technological centres is to support and link smart healthcare initiatives to a broader ecosystem.
- **Sustainability of the projects** and technological infrastructure is mentioned as a reoccurring challenge in the field of smart health, which is closely linked to the operational model of existing funding mechanisms. Funding that is limited to two or three years puts the sustainability of projects at risk. For example, in the field of healthtech innovation the role of the 'Nobel' project focused on what comes after the finalisation of the project activities and established an independent structure to continue its operation. There is also a need to provide a framework which creates certainty about feasibility, and which ensures that the solution can be brought to the market. Companies need to become able to secure sound sources of revenues, for example through public procurement or other services.
- **Pilot trials** are unique opportunities for SMEs to test their technology in the field of smart health. Innovation trials, not only clinical trials, should be more easily

accessible for SMEs, since it is difficult to test the technology in hospitals. However, stakeholders also commented that pilots are a short-term solution and that the focus should rather be on how to further implement technologies when the pilot trials are finalised. Additionally, these initiatives should be linked to projects and programmes at the national level.

- **SMEs require a rulebook** that helps them better understand the current ecosystem. They have limited experience to propose research priorities and agendas for cross-technology innovation, especially when interacting with the European Commission and other funding entities. By demonstrating the efficiency gain for hospitals and the public health system, the needs of SMEs can be also addressed. Not only there is a lack of incentives, but SMEs must be provided with the knowledge to develop their products beyond a stand-alone solution. Cross-technology solutions need to become ready to be scaled up.
- Other needs mentioned that should be addressed to ensure a smoother pathway for SMEs and the introduction of their innovation technology to the market are:
    - Specific boost for technology infrastructure that is dedicated to helping SMEs in the field of smart health
    - Address the complexity of manufacturing and supply chain in the EU
    - Networking without more complexity and building synergies with business acceleration services, the tools of the European Institute of Innovation and Technology, the European Innovation Council and cluster organisations
    - Establish links to regional strategies and co-investment
    - Access to good quality datasets due to the fact that data are essential and require large infrastructure
    - Access to experimentation and testing facilities
    - The market demands the involvement of the broader smart health ecosystem, including clinicians, hospitals, payers and patients. This is important in order to enable the testing and validation of novel products and services
    - Support to the various procedures, such as the regulatory approvals throughout the clinical workflow
    - Cross-border access (especially for SMEs).
- Digital solutions have to be tangible and clear, and the focus should be on well-functioning integration into the workflow so that health care professionals actually start using the solution. Additionally, trust and awareness among healthcare professionals and patients is important and can be achieved with the integration of their feedback via clear feedback loops. **Integrated care groups can be used for modelling the needs of patients.** These groups can be set up as virtual personas built upon actual patient use cases to find healthcare solutions and the connection with the ecosystems with the health care professionals and patients.

Policy gaps and scope for synergies:

- There is a lot of innovation and entrepreneurship going on in the field of digital health, but it requires a big jump to introduce these innovations to the market. Digital Europe will help to bridge the gap between research and innovation, commercialise innovation and offer solutions for scale up.

- Another issue is a **fragmented market,** not only in terms of resources, but also in terms of locality, procurement and value. While indeed, digital health can grow and go across borders, there are still further difficulties in truly scaling up at a European scale. Most adoption still happens through public procurement and more cross-border procurement initiatives are necessary.
- In digital health, **access to data** is vital to build solutions, especially in terms of validation of the data. A lot of data are held within silos in research institutions and hospitals or in the hand of citizens. There is no mechanism in place to make the exchange of data accessible. There should be a stronger focus on data and how to deal with access to large scale datasets.
- Policies need to reflect more about the **acceptance of patients and citizens to support the adoption of digital health**. One solution is more uniformity in the assessment frameworks, as well as in reimbursement pathways. In terms of value-based healthcare to increase the care and reduce the cost, the focus should be placed on the perspective of the patient and defined by patient groups. AI and other technologies can be essential to answer the calls that benefits the workflow.
- There is also a fragmentation in the **legal landscape due to General Data Protection Regulation (GDPR)** and the restrictions in using and re-using data. New technology will help including privacy enhancement technologies and synthetic datasets. However, GDPR remains an obstacle for secondary use and sharing of sensitive data. There is a need for better integrating electronic health records not only to provide a seamless experience for the patient but also to improve communication between health professionals and research.
- There are fragmentations in terms of support. At national and regional levels, very often two different directorates deal with SMEs within the economic and the healthcare fields which need to be bridged. Pan-European networks can address this policy gap.
- SMEs that want to internationalise must understand the healthcare innovation landscape in each region and country. There are many differences in the workflows. **A network of technology centres can assist and facilitate better understanding of national/regional contexts**, but clusters are also relevant stakeholders to inform SMEs about the local context and rules. There should be better coordination between technology providers (RTOs), clusters who know their SMEs and the industry associations to offer a joint service. There is added value if the network of technology centres and the nodes can become the link between these stakeholders. There is a gap on how to execute this in terms of market access. This is also important to create more long-lasting sustainable structures.
- EU funding programmes are the true 'compass needle' of the ecosystem. The network should ensure that they can get mentoring about how to innovate. Funding should also allow that any consortium can implement emergency projects for the development of specific technology, such as in the current situation of the pandemic. The programmes should be accessible for all companies at a competitive basis. However, duplicates should be avoided.

Future networks of technology centres and their potential service portfolio:

- Future networks of technology centres should build up **complementary service portfolios**. For instance, in a collaboration between Copenhagen and Helsinki, dedicated services have been put in place in various hospitals which are friendly towards SMEs and startups and ensure opportunities for smart health in a cross-border setting. Living labs should play a key role in any future networks of technology centres.
- Joint services have to be differentiated for different kinds of companies and their specific needs should be addressed. Access to structured information, the visibility of infrastructures and services are particularly important.
- Another important aspect is the **capacity building of companies** that are trying to scale up at a European level. Any future network of technology centres should be built around national contact points which can link companies and find opportunities. There is a need for mentorship, in particular for traditional medical technology or unexperienced companies.
- Patients and citizens should be in the centre of technology innovation and development. A way for networks of technology centres to provide support is to co-design the smart health offer and technology with SMEs, patients and healthcare providers. The various levels such as RTOs, academics, SMEs need to be connected, **firstly, by listening to the final users and secondly, listening to large firms and using them as a compass.**
- It is important to be pragmatic and **embed any future network into national and regional ecosystems and clusters** that constitute a natural platform and link technology, startups and traditional SMEs locally. There is a role to be assigned to the RTOs and technical universities in terms of the maturation of the technology and access to startups in the field of smart health. It is important to better explore the links between advanced technology centres and the European cluster collaboration platform.
- There is a need for technology centres to **provide general direction and oversight**, more specifically to:
    - ensure a strong synchronisation between the different initiatives, for example strongly building upon the Digital Innovation Hubs (e.g. the European mHealth hub)
    - establish a library or 'yellow pages' of accomplished initiatives and good practices that can create awareness for SMEs. Introducing such a library should come from a top-down approach and provide a one stop shop landing page for SMEs where they can get assistance for their technology projects and information where to get funding.
    - put in place cross-border brainstorming sessions with SMEs to get the latest ideas on the development of technologies.

Relevant links that were shared during the webinar:

Title	Link
Advanced Technologies for Industry reports related to smart health	https://ati.ec.europa.eu/reports/product-watch/artificial-intelligence-based-software-medical-device
ATI Technology Centres	https://ati.ec.europa.eu/technology-centre/mapping
European Partnerships in Horizon Europe	https://ec.europa.eu/info/horizon-europe/european-partnerships-horizon-europe_en
Industry web site on Health Partnerships	www.euhealthppp.org
NOBEL Project	https://nobel-project.eu/continuum-integrated-care-movie/
Assessment of Member State rules on health data	https://ec.europa.eu/health/ehealth/key_documents_en#anchor1
Interreg Europe project Medtech4 Europe	https://www.interregeurope.eu/medtech4europe/
Position Paper by Nordic Research and Technology Organisations	https://en.gts-net.dk/position-paper-by-nordic-rto/
Smart Pilots Interreg Europe Factsheet	http://www.bbeu.org/pilotplant/wp-content/uploads/2018/06/Report-on-SmartPilots-Factsheets-and-Survey_Final_14May2018.pdf