DEI Working Group 1

Digital Innovation Hubs: Mainstreaming Digital Innovation Across All Sectors

Kick-off Meeting, 20 October 2016

Meeting Report

Executive Summary

Digital Innovation Hubs within the DEI

DEI Working Group 1 focuses on Digital Innovation Hubs (DIHs) as a means of supporting businesses, and notably SMEs and non-tech industry, in their digital transformation under the Digitising European Industry (DEI) initiative. The WG held a first meeting in Brussels on 20 October 2016, where the discussion focused on three key issues:

- What are the needs of industry with respect to digital transformation?
- How to develop a network of Digital Innovation Hubs in Europe that reflects these needs?
- Which investments are necessary to successfully build the network of DIHs?

The DEI Strategy aims to ensure that any business in Europe should have access to a Digital Innovation Hub at 'a working distance' (i.e. within a form and location convenient for their day-to-day business). Hubs should also play a key role in assessing skills needs and in skills delivery.

Digital Innovation Hubs as Tools for Digital Transformation

Key messages from the Meeting were:

- The WG **strongly supports the proposed European network of Digital Innovation Hubs** as a means of supporting business, and especially SMEs and non-technology intensive industry, in seizing the opportunities of digital transformation.

- **Europe has a wealth of knowledge and experience in hub-type initiatives** on which to draw in implementing such a network. At present, however, the available provision is not sufficiently visible either to industry or to other hubs and initiatives. Much greater transparency is required, so as to facilitate access for companies and mutual learning between service providers.

- Digital Innovation Hubs must **cater for a broad spectrum of needs and as such will have many facets**. They must be agile and demand-led, and build sustainable innovation ecosystems, not just gateways to services. Whilst there can be no 'one-fit-all' approach,

Hubs should be united by common values based on independence, a commitment to excellence and customer service, and a proactive, innovative approach.

- Digital Innovation Hubs will need **a clear value proposition** that complements, rather than replicates, existing forms of business support. Core services offered by Hubs should include: sensitizing and visioning around the business potential of digital technologies; working with companies to assess their digital maturity and develop appropriate plans; mentoring and training; cost-effective access to specialist experimentation and testbeds; and access to funding.

- In the commercial marketplace, too, **Digital Innovation Hubs must not crowd out existing offers**, facilitating access to digital IT SMEs and professional services companies rather than competing against them.

- **Various funding and business models for Hubs can be envisaged**. Membership fees, training, contract R&I, testing, and service brokerage are all potential revenue streams. In most cases, a mixed model would be pursued. Public bodies can provide valuable pump-priming funds to help create Digital Innovation Hubs.

- **Establishing and strengthening a European network of Digital Innovation Hubs** will require, among other measures: mapping service provision and sharing information; building capacity and skills in both breadth and depth; building collaboration between hubs, both physically and online; and creating incentives for SMEs and others to engage with the network. Important issues relating to coordination and governance of the network require further exploration.

- **Building the network will require two separate but closely related streams of work**: i) the development of activities and services for the SME market; and ii) the development of activities and services to help hubs themselves to grow and improve, which are not part of the offer to businesses.

- Whilst **a great many investment tools and funding programmes exist**, the best means of mobilising these to meet the requirements of the DIH agenda remains an open question. The aim should be to create an 'investment triangle' between region-technology-funding, with the three elements being co-located. Further consideration is required on the roles of national/regional versus European funding, and investment approaches for regions with no existing infrastructure.

Future meetings will explore additional aspects of the WG's Mandate as set out by the DEI Roundtable.

1. Introduction

1.1 Background to DEI Working Group 1

The Digitising European Industry initiative (DEI) aims to ensure that any industry in Europe, big or small, wherever situated and in any sector can fully benefit from digital innovations to upgrade its products, improve its processes and adapt its business models to the digital change. This requires not only a dynamic digital sector in Europe but also the full integration of digital innovations across all sectors of the economy. The DEI initiative is based on an ambitious collective effort involving public and private stakeholders across Europe at regional, national and EU level.

A key element of the DEI is Digital Innovation Hubs (DIHs), which aims at supporting businesses, and notably SMEs and non-tech industry, in their digital transformation.

The Commission plans to focus €500m investment from Horizon 2020 on Digital Innovation Hubs on:

- Networking and collaboration of digital competence centres and cluster partnerships.
- Supporting cross-border collaboration of innovative experimentation activities.
- Sharing of best practices and developing, by end of 2016, a catalogue of competences.
- Mobilising regions with no Digital Innovation Hub to join and invest.
- Wider use of public procurement of innovations to improve efficiency and quality of the public sector.

The Commission has also set up a thematic Smart Specialisation Platform for Industrial Modernisation. The Commission encourages Member States and Regions to invest in DIHs and incentivise industry to embrace digital innovations. The Smart Specialisation Platform may be used to team up with different stakeholders to develop a business plan for a DIH and to find the necessary investments.

The policy is set out in detail in a Communication[1] adopted in April 2016. Its implementation is being supported by a Roundtable of High-Level Representatives of Member States' initiatives, industry leaders and social partners, to be held twice a year.

To support its work the Roundtable has set up two Working Groups in order to make progress on aspects of the implementation of the DEI Action Plan. Each Working Group (WG) is tasked to produce a report supporting the implementation of specific DEI actions. They will perform fact finding, collect best practices and formulate recommendations, for example on policy matters and mobilisation and leveraging of investments, addressed to the High-Level Representatives attending the Roundtables.

1.2 Mandate of Working Group 1

The Roundtable has issued the Working Group 1: Mainstreaming Digital Innovation Across All Sectors with the following mandate:

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[1] Digitising European Industry (DEI): Reaping the full benefits of a Digital Single Market. Communication (COM(2016)/180)

- Describe current approaches and best practices and **elaborate in more detail the Digital Innovation Hub approach** and the plans for their further development.
- Reflect on how **Member States, regions and the private sector could fund the expansion of Digital Innovation Hubs** from sources such as the ESIF[2], EFSI, or other national and regional funds, mobilising at least €5bn from different financial sources.
- Advise on specific actions needed to **mobilise all levels of policy and decision makers**, including investment by the private sector and connecting to the investment community.
- Reflect on how to best support the **proposed mapping of Digital Innovation Hubs in Europe**.[3]
- Reflect on how **the objectives of Smart Specialisation and the Digital Innovation Hubs schemes** put forward in H2020, such as I4MS, could be mutually reinforcing, and in particular to reach out to less developed regions.
- Identify areas where **wider use of public procurement of innovations** would support the further development and scaling up of digital technologies.

The WG was tasked to develop **a report on approaches, best practices and plans for the roll-out of Digital Innovation Hubs** according to the following schedule:

- A first draft of the report before the end of December 2016
- Revised draft for the DEI Stakeholder Forum (end of January 2017)
- Final version for Hannover Fair, April 2017.

The WG held a first meeting in Brussels on 20 October 2016. Around 80 representatives from industry (including SMEs), Member States, regions, and social partners attended and addressed a series of questions related to the above Mandate. The meeting comprised a series of scene-setter presentations and exchanges of thoughts and ideas in smaller discussion groups.

This Meeting Report summarises presentations and discussion from this first meeting and starts to elaborate ideas for the WG's draft report.

2. Digital Innovation Hubs: A Key Agent for Mainstreaming Digital Innovation

2.1 The Digitisation Challenge

The use of digital technologies in industry varies across sectors and Member States, particularly between high-tech areas such as aerospace and more traditional areas such as construction. There are also large disparities between large companies with the capacity to invest in innovations and SMEs that struggle to keep pace with fast technological development. With many countries lagging

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[2] This includes for example the development of the required high-level master plan for Digital Innovation Hubs supported bottom-up through the ESIF programme (Structural Funds).
[3] The European Commission plans to launch a study to map dynamically digital innovation hubs encompassing the actual data and a tool/portal to make this data accessible.

behind in the creation of favourable conditions for digital entrepreneurship, the progress among Member States also reveals a scattered picture.[4]

In surveys, close to two-thirds of managers in industry:

- have difficulties in assessing the Return on Investment in digital innovations;
- have problems with trusting the technology;
- are not sure about the maturity of the latest technologies (Big Data, AI, robotics, …);
- are not clear about compatibility/interoperability with legacy systems;
- are afraid of being locked in with one vendor.

For SMEs, the proportion is even higher. Thus, there is a clear need from industry not just for information but to be able to test and experiment before engaging in digital innovation.

Under the DEI, it is proposed to make the latest digital technologies available for all industry anywhere in Europe through networks of Digital Innovation Hubs.

A Digital Innovation Hub refers to an ecosystem through which any business can get access to the latest knowledge, expertise and technology for testing and experimenting with digital innovations relevant to its products, processes or business models. The Hub can also provide connections with investors, facilitate access to financing of digital transformations of businesses, and help connect users and suppliers of digital innovations across the value chain.

The core of a Digital Innovation Hub is one or multiple 'competence centres'. These provide advanced technical expertise and facilities (labs, infrastructures, pilot lines for production, etc.). They cooperate with partners in the innovation chain to support businesses in their digital transformation including investors, business development and legal experts. No one competence centre can be excellent in all digital fields. Hence the need to network between competence centres (and their hubs) with complementary disciplines so as to offer a 'one-stop-shop' for businesses.

The goal is to ensure that any business in Europe should have access to a Digital Innovation Hub at 'a working distance' (i.e. within a form and location convenient for their day-to-day business)**.**

In comparison with competence centres, where technology transfer activities are normally focused on collaboration with the digital supply industry (including start-ups and SMEs), the DIHs will add more intensive cooperation with businesses from all industrial sectors that were so far considered as just users of technology. The activity of DIHs is driven by the demand for digital innovations. The approach is "bottom up": by providing access to latest digital know-how and technology, any business can become an active digital innovator.

The concept of Digital Innovation Hubs and issues related to their development are further explained in the Commission's Background paper.[5]

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[4] See, for example, Digital Entrepreneurship Scoreboard: http://ec.europa.eu/growth/tools-databases/
[5] *Stock taking on initiatives supporting the development of Digital Innovation Hubs: Lessons learned from EU and national actions*, European Commission

2.2   Digital Innovation Hubs in Practice

Many examples and models of existing Digital Innovation Hubs can be found across Europe. Cases profiled at the WG Meeting included the following, all of which emphasized an ecosystem approach.

I4MS[6] consists of 11 large Innovation Actions funded by FP7 and H2020. It supports SMEs active in the manufacturing sector to improve their products and processes by letting them experiment with digital technologies, such as HPC cloud-based simulation/analytics services, industrial robotics systems, laser-based manufacturing, smart cyber-physical systems, and Internet of Things. A network of competence centres provides access to competences and technology transfer to SMEs through competitive calls for experiments. Successful candidates receive funding for the experiment, from which both technology suppliers and user SMEs may benefit. So far €110m of funding has been invested in I4MS since 2013.

One of these networks is **Fortissimo**, which provides SMEs with easy and cost-effective access to advanced simulation, visualisation and data analytics. The SMEs are provided with expertise, tools and means to tap into European Cloud of HPC resources and software applications to design high-tech products and ultimately boost their business. To date over 100 SMEs have been involved in 94 experiments across its 16 innovation hubs.

In the UK, the High Value Manufacturing Catapult has established a **Manufacturing Technology Centre** to assist UK companies in applying advanced manufacturing system solutions. The MTC focuses on TRLs 4-6 (applied research and development), helping companies to bridge 'the valley of death' in deploying new solutions in their businesses. Around £40m has been invested in four specialist centres, each of which includes match funding from industry. The MTC funding is split roughly equally between core public funding, commercial funding and competitively won R&D.

The MTC now has an established ecosystem comprising universities, industrial partners, as well as a Business Launch Centre and an Advanced Manufacturing Training Centre. It is very much end-user driven, focusing on a matrix that matches enabling technologies (connectivity, data technologies, autonomous systems) against industrial needs (product quality, equipment health, flexible systems).

The results have been impressive: an independent evaluation has shown that for every £1 of core public funding received the MTC produces £15 in net benefits to the UK economy.

On 15 November the MTS is organising the Digitising Manufacturing Conference 2016[7]. This will give you the opportunity to see MTC and how they work.

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[6] ICT Innovation for Manufacturing SMEs (I4MS, www.i4ms.eu)
[7] www.digitising-manufacturing-2016.eventbrite.co.uk
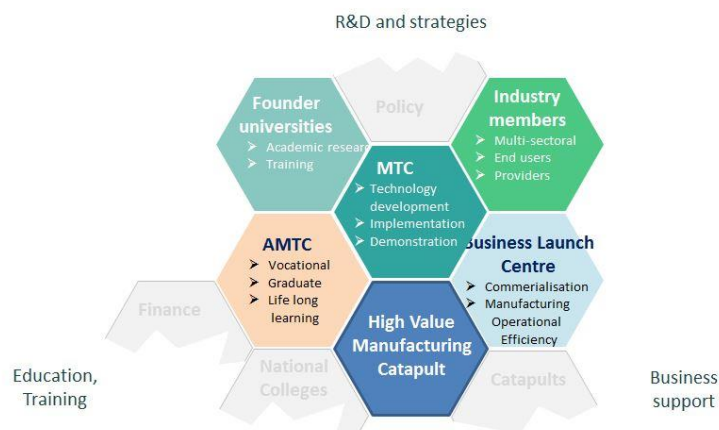
The MTC Ecosystem *(courtesy of MTC)*

In Ireland, national funding for science and innovation is shifting to research centres focused on national economic priorities. One of these centres, the **Tyndall National Institute** is partnering with a number of regional and national clusters to: launch needs-driven regional and national initiatives; coordinate with public authorities and local government; build European partnerships; and provide B2B match-making and brokerage. For example, Tyndall is part of Ascent, a European project providing SMEs with access to state-of-the-art facilities in nanoelectronics.[8] It is also a partner in PIXAPP, a H2020 project offering the world's first open access photonics packaging pilot manufacturing line. Other activities apply advanced ICT in sectors as diverse as medicine and agriculture, including support for IoT SMEs in accessing funding. Essentially, Tyndall is helping to create innovation networks with multidisciplinary translational competences.

2.3   Closing the Digital Skills Gap

Digitisation brings an associated need for upskilling of the workforce across the new digital economy. The situation in Europe is critical in this respect and is the subject of numerous reports and studies.[9] Some headline figures serve to illustrate the point:

- 37% of the EU workforce has insufficient digital skills; 13% have no digital skills at all;
- Employment of ICT specialists has grown by 2.9 million in the EU over the last 10 years;
- 40% of enterprises trying to recruit ICT professionals have difficulty doing so;
- The number of ICT vacancies in the EU is predicted to rise from 337k in 2015 to 756k by 2020. Such an increase is a clear sign of market failure.

The New Skills Agenda for Europe aims to address the digital skills gap. Adopted in June 2016, it foresees digital skills in all actions, in particular under:

- A Skills Guarantee to help low-skilled adults acquire a minimum level of literacy, numeracy and digital skills and progress towards an upper secondary qualification.
- The 'Blueprint for Sectoral Cooperation on Skills' to improve skills intelligence and address skills shortages in specific economic sectors.

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[8] www.ascent.network
[9] [refs needed]

Building on the achievements of the Grand Coalition for Digital Jobs, the Digital Skills and Jobs Coalition will build multi-stakeholder partnerships (spanning education, business, social partners, Member States) to tackle the digital skills challenge with concrete actions.

Digital Innovation Hubs could and should play a key role in assessing skills needs and in skills delivery. How to identify best practices and the best means of connecting Hubs with skills providers in the ecosystem – including the use of European funds – are open questions. On the 1st of December there will be a launch conference of the Grand Coalition in Brussels. Anybody who is interested in the link between Digital Innovation Hubs and skills, may participate. In that case, please send an email to cnect-digital-skills@ec.europa.eu so we can send you an invite.

3.   Towards a European Network of Digital Innovation Hubs

Discussion at the WG Meeting focused on three key issues:

- What are the needs of industry with respect to digital transformation;
- How to develop a network of Digital Innovation Hubs in Europe that reflects these needs;
- Which investments are necessary to successfully build the network of DIHs.

Each of these issues was broken down into sub-questions which are reproduced in the relevant sections below.

3.1   Meeting Industry Needs

To be successful, it is essential that Digital Innovation Hubs address the needs of industry in responding to the digitisation agenda. Participants considered this in terms of the following questions:

What are the needs of the industry in your region (also related to skills)?
- *What do competence centres and DIHs need to offer to support industry in your region more effectively?*
- *Which building blocks are already available in your region (innovation programmes, competence centres, clusters, innovation services, training, production facilities, testing and validation infrastructure, ….)*
- *How can DIH support companies on digital skills?*

Market Needs

Digital Innovation Hubs need to cater for a broad range of companies. Potential clients range from early adopters keen to climb the technology ladder, to traditional SMEs who may be 'behind the curve' and need some convincing about the benefits of new digital technology. Thus, the client base spans a wide spectrum, from the digitally 'mature' to 'immature'. Services will need to be equally broad and accessible to companies through multiple entry points.

More specifically, enterprises and SMEs are seeking:

- Process optimisation based on ICT;

- Improvement and development of ICT-based products and business models;
- General support on ICT usage within business and manufacturing process.

Awareness raising alone is not enough: companies will be looking for a clear and demonstrable business case. So as well as information, the Digital Innovation Hubs will need to demonstrate (not just explain) the benefits of the technologies and work with individual SMEs to transform and change their business models. They should show clients how to build the business case, covering the industrial process and the commercial process, and offer them the opportunity to engage in pilots with user communities (using specialist DIH testbeds).

All of this should be communicated in a language that SMEs understand; for example, narrowing down to specific technologies, such as 3D Printing, rather than headline terms such as 'Industry 4.0' or 'digital transformation'.

While the demand is clearly established, industry does not know where to go at present. There is a lack of trust in information on digital innovation. Hubs need to be 'honest brokers', facilitating exchange of information and access to services in a trusted way. They should be 'one-stop-shops', offering a single point of contact for trusted and consolidated advice, funding and expertise.

Good Practice Example: Vanguard Initiative

The Vanguard Initiative was established in 2014 and is a coordinated effort by 30 EU regions to better align their regional smart specialisation strategies. It has pioneered a new approach to support internationalisation and competitiveness of EU industry by bringing regions (and clusters) together to:

- discuss common objectives and find complementarities;
- map and better understand regions' industrial competencies and capabilities;
- develop joint strategic action plans (building critical mass and complementary specialisations); and
- align strategic investments arising from these roadmaps.

The goal is to create 'inter-regional smart specialisation platforms' and to explore how the combination of different strengths can lead to a faster deployment of new technologies.

The methodology is currently tested in five pilot actions in the areas of: innovative use of biomass; efficient and sustainable manufacturing; high performance production through 3D-printing; components for marine renewables and offshore energy applications; and new nano-enabled products. These pilots will be further supported by the Smart Specialisation Platform on Industrial Modernisation (see below).

See: www.s3vanguardinitiative.eu

Existing Initiatives

Market needs are very diverse and vary by technology, sector and region. Many initiatives relevant to the proposed Digital Innovation Hubs exist at regional, national and European levels and span the public and private sectors. Examples include competence centres, KICs,[10] regional innovation

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[10] Knowledge and Innovation Communities are partnerships facilitated by the European Institute of Innovation & Technology (EIT) that bring together businesses, research centres and universities.

centres, KET centres,[11] Vanguard pilot lines (see box), and the network of accelerators under the FI PPP (see box).

Industry needs to be well informed about the availability of these initiatives and what they offer in order to make best use of them. As yet, however, we do not have a clear view of what is happening 'on the ground', especially outside of European initiatives.[12]

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[11] Centres that promote the group of six Key Enabling Technologies: micro & nanoelectronics, nanotechnology, industrial biotechnology, advanced materials, photonics, and advanced manufacturing technologies.

[12] The Commission background paper *Stock taking on initiatives supporting the development of Digital Innovation Hubs: Lessons learned from EU and national actions* provides an initial mapping.

Good Practice Example: FIWARE Accelerators

The Future Internet PPP has developed an open source platform (FIWARE) offering APIs to developers. In order to make these technologies (enablers) better known the European Commission funded 16 accelerators to promote their deployment in real-world applications.

The accelerators organised open calls on specific domains, such as health, media, smart cities, agrifood, Industry 4.0. SMEs, start-ups and web developers were able to apply for up to €100k to develop their application. The initiative attracted over 10,000 submissions, from which more than 1000 SMEs and start-ups were selected to be part of the FIWARE business acceleration programme.

Each of the 16 accelerators has developed its own partners' network, linking offices and innovation hubs sometimes in distant countries, connecting tutors, mentors, developers and entrepreneurs, building bridges between people and places, assembling an open community around technology. The accelerators collaborated to exchange experiences and were also linked to European regions in order to take advantage of local ecosystems and regional smart specialization.

See: www.fiware.org/fiware-accelerator-programme

The Digital Innovation Hub Offer

The Digital Innovation Hubs should develop an offer based on specialised/targeted services that address their client's specific demands. They will need to pioneer a new and distinctive approach and not replicate forms of business support that are readily available elsewhere, for example within universities, business schools and training centres. Naturally, this brings a risk that they are not accepted by existing providers, meaning that they will have to build relationships there too, showing that they complement rather than compete with existing forms of business support.

The Digital Innovation Hubs' portfolio of services should include:

- Disseminating information, including use cases and business models
- Visioning and strategy development for businesses
- Mentoring key personnel
- Training, both technical and management
- Needs/maturity assessment
- Access to funding and investor readiness services
- Access to specialist infrastructure, testbeds and pilots
- Collaborative research on issues of common interest.

Potential approaches (i.e. means for delivering the services) include:

- Online portal of competences, use cases and specialist services
- Roadshows
- Matchmaking/brokering events between stakeholders (e.g. digital IT SMEs, user SMEs, supply chains, investors, other regions)
- Innovation camps
- Hackathons.

Digital Maturity Assessment is likely to be a key service. This would be either a survey undertaken by Hub experts or a self-help tool that the company could apply itself. It would diagnose the company's needs and readiness in relation to digital technologies, provide feedback on the level of

maturity, and direct the client to further tailored help and advice within the Hub's ecosystem. This could include referrals to recognised private sector suppliers (digital IT SMEs). However, even such assessment services might be seen as competing with private companies offering professional services (consultancies, lawyers) and so conflict with the Hub's role as 'honest broker'.

Easy and cost-effective access to specialist testing, pilot and experimentation facilities is a unique part of the Hubs' offer. Such facilities are often complex and expensive and no one hub will be able to afford to equip itself with all relevant testbeds. Hence, this is a key area for hub-to-hub collaboration, with hubs sharing and opening up their facilities to others within the network. It might even extend to co-investment between hubs/regions in new facilities.

Training and skills will be an important part of the Digital Innovation Hubs' portfolio. Activities should cover the whole employment spectrum. Students should be introduced to the fundamentals of digitisation and its potential. Industry should communicate its vision about future needs and requirements to academia and collaborate in developing curricula, such as pan-European Masters courses. Junior employees should have opportunities to take digitally-based apprenticeships and employees at all levels should have access to courses to upgrade their competences. Managers, too, will need to hone their skills around economics and business models. Means should be found to ensure continuous feedback from industry on training and skills needs.

Access to funding will be another key service. Digital Innovation Hubs should help SMEs and startups to access regional, national and/or European funding to make use of new technologies, possibly in line with regional Smart Specialisation Strategies. They could also help and support SMEs to explain their strategies to banks and private investors who often do not understand the need for (apparently) low-tech companies to 'go digital'.

3.2   Building the Network

Having identified the needs, it is necessary to consider how Digital Innovation Hubs can best meet those needs, both individually and collectively, and how the DIH network should be configured. Participants addressed this through the following questions:

How can we build a network of Digital Innovation Hubs that can serve companies from all over Europe at "working" distance?
- *How to ensure that the knowledge of the network, in particular missing competences, reaches out to the DIH where it is needed?*
- *How to reach out to regions without DIH?*
- *How to foster synergies and collaboration between DIH and relevant competence centres, such as KETs Technology Centres/ Pilot Lines?*

The Value Proposition

The value proposition for Digital Innovation Hubs should reflect the industry needs. This amounts to more than simply a list of solutions and services: it goes to the heart of the Hubs' mission and how they operate.

More specifically, Digital Innovation Hubs need to be able to:

- Speak the language of SME businesses and understand their needs;
- Market themselves and actively identify relevant customers for their services;
- Possess significant know-how in both technical areas and business management;
- Understand business models and business transformation and be able to help companies transform;
- Broker between the needs of industry and relevant technology providers in an independent and unbiased way;
- Work with companies at all levels of digital maturity, including offering low-tech transfer to companies lower down the maturity curve.
- Provide funding or facilitate access to funding from external sources.

As MTC, Tyndall and other successful cases show, Digital Innovation Hubs have to be sustainable ecosystems, not just buildings. As such, they will need to engage actively with their local community and with the wider network of Hubs across Europe. Rather than being just gateways to services, hubs should be – as the name implies – deeply embedded within their communities.

Elements for this ecosystem include: universities and RTOs; chambers of commerce; vocational training centres and schools; supply chains; consulting companies and advisors; digital IT SMEs; clusters, networks and associations; and funding agencies and programmes. Hubs have to stimulate, nurture and animate this stakeholder network in a way that meets the needs of client businesses (enterprises, SMEs, entrepreneurs) while also delivering added value themselves. Hence, Hubs are part ecosystem, part marketplace, a combination of accelerator and incubator.

No one model will fit all: variable geometries could and should exist. What should be common are *the values and ethos*: independence, a commitment to excellence and customer service, and a proactive, innovative, agile approach.

The attitude toward and relationship with the private sector will be key. Hubs must not distort the market for digitisation products and services. Clear frontiers should be established so that rather than competing against existing digital SMEs, Hubs create networks that facilitate non-tech SMEs to access their expertise.

Strengthening the Network

Establishing and strengthening a European network of Digital Innovation Hubs will require, as a minimum, the following steps:

- **Map service provision and share information**: A central information portal should be setup in order to provide greater transparency on the range of initiatives available. This catalogue or web-based tool should document the types of hub, their competences, services, facilities, etc. It should be widely disseminated to industry and multiplier organisations (industrial associations, Hubs themselves, other networks), and regularly updated and maintained. The portal should be used to share experiences and disseminate use cases, for example, to stimulate reuse of solutions between industry verticals and between regions.

- **Build capacity and networks**: Digital Innovation Hubs need skills in both breadth and depth. On the one hand, they need the 'soft skills' necessary to communicate with companies, assess their business needs, and promote their own offer. On the other hand, they need

specialist technical and management skills to provide tailored solutions, or to access these from elsewhere in the network. Hubs must also be proactive in building networks of stakeholders that help them to engage with companies and others. Stakeholders should be involved in governance so as to help Hubs to define their long-term goals.

- **Build collaboration**: Hubs could collaborate in a number of ways: developing a common approach to service provision (e.g. covering contracts, IPR); developing common services and solutions (e.g. training, tools, events); putting in place exchange programmes between Hubs and/or between client companies;[13] and identifying best practices and areas of competence excellence around which to develop links. The information portal mentioned above could evolve into a more general digital collaboration platform.

- **Create incentives**: Incentives should be put in place to encourage SMEs to engage with the Hubs and their activities, and also to encourage Hubs to engage with each other. In general, such activities should be financed by local (national/regional) agencies. EU funds could be utilised to incentivise collaboration and exchange (e.g. travel, events), build skills, and undertake research to directly support Hubs in their mission. To ensure activities stay close to the market, cross-border supply chains should also be leveraged for the collaborative development of Digital Innovation Hubs across regions. Such interactions would have a real and clear benefit for all supply chain actors.

As well as innovation within the Hubs themselves, there should be dynamic thinking at national level so as to facilitate them in doing their job. This means, for example, showcasing how Digital Innovation Hubs can be organised, engaging with local/regional clusters and competences centres, and creating space for bottom-up initiatives to emerge. National agencies could also show how ESF could be used to create DIHs.

All Hubs should, of course, be sustainable and based on sound business models – an issue addressed further below.

In summary, building the network will require two separate but closely related streams of work:

1) The development of activities and services **for the marketplace**, i.e. that form part of the Hubs' offer to client businesses;
2) The development of activities and services **to help hubs themselves to grow and improve**. These are not part of the offer to businesses but facilitate collaboration between hubs and their efficient operation as a European network. This includes consideration of coordination and governance issues, aspects that require further exploration (see box)

Coordination and Governance of the DIH network

The notion of a European Network of Digital Innovation Hubs raises the question of what form of coordination and governance such a network would require. While a 'light touch' is foreseen, with minimal central coordination, *some form* of coordination will certainly be needed. This aspect was only touched on tangentially at the WG Meeting.

Issues to consider include:

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[13] For example, exchanges based on the Erasmus model. The scheme could be open both to members of the DIH network and professionals from industry, and could offer both short-term and long-term assignments.

- What would be the criteria for admission/recognition to/within the DIH Network? For example, should a minimum set of services be offered; or should a hub have to meet set conditions in a specific area of service/specialisation.
- Would some form of certification mechanism be necessary and if so by whom?
- What profile should the term 'Digital Innovation Hubs' have within the marketplace? Should it be a brand in its own right or remain in the background as a policy instrument/tool?
- How would issues of competition between Hubs be addressed?
- What governance structures, if any, would the network require?

3.3   Investing in Digital Innovation Hubs

Significant investment will be necessary to realise this vision of a European network of Digital Innovation Hubs accessible to businesses in all sectors and regions. Discussion focused around the following questions:

How to invest in Digital Innovation Hubs?
- *What is the volume of investments (public and private) necessary in your regions to satisfy the demand of digital transformation services of the industry?*
- *Which investments are already foreseen by you?*
- *How can we create synergies between on-going investments and potential Digital Innovation Hubs?*
- *How to maximize the impact of innovation hubs in the context of the Smart Specialisation Platform on Industrial Modernisation?*

Financing Digital Innovation Hubs

The full development of a network of digital innovation hubs calls for a surge in investment in adequate competence centres and in capacity to deliver the services to implement digital transformations.

The volume of investment necessary is difficult to assess at present. Under Commission proposals, it is foreseen that over the next five years an additional 100 new hubs and an upgrade of 200 existing hubs will be required. This means:

- Around 20 new hubs to be established every year with investments primarily targeting the establishment or reinforcement of digital competence centres, focusing on development and experimentation facilities and on relevant expertise (technical, business and financing) to support industry in its digital transformation.
- A regular re-assessment of existing Digital Innovation Hubs across regions in Europe leading to updating and upgrading the existing facilities and resources (40 hubs upgraded per year). All hubs need to have sustainable business models.

The proposed investment plan will take into account the diversity of starting conditions and future needs in the regions and countries. National and regional public-private partnerships are shaping co-investments through their national initiatives on digital transformation. Possible funding sources are ESIF, EFSI, or other national and regional funds. In total at least €5bn from different financial sources

needs to be mobilised. A more detailed study would be required to assess this more accurately. The following table gives an initial overview of the necessary investments.

2016-2020	# of hubs	EU (planned)	MS (digital focus)	Industry
EU networks (continuation/ refocus/stream-lining of I4MS, SAE, iHubs, ODINE, ECHORD, ACTPHAST, …)	250 hubs (10-20 digitisation experiments per hub)	500M€ (from H2020) (additional cost on top of basic national or regional infrastructures)	Basic innovation/ competence centre infrastructure	150M€
New hubs	100		2000M€	Incl. in MSs
Reinvestment, upgrading of national or regional hubs	200		3000M€	Incl. in MSs
TOTAL		500M€	5B€	

Mobilising Investment

It is clear that a great many investment tools and funding programmes exist and need to be mobilised. These include at European level Horizon 2020, Cohesion funds (ESF), EFSI,[14] EIB, and Erasmus+, as well as national and regional funds. The new Smart Specialisation Platform for Industrial Modernisation, which aims to mobilise co-investment in new industrial value chains within European regions, is seen as an especially important vehicle (see box). The aim should be to create an 'investment triangle' between region-technology-funding, with the three elements being co-located. Structures should be transparent so as to prevent double investments.

Various funding and business models for Hubs can be envisaged. Membership fees, training, contract R&I, testing, and service brokerage are all potential revenue streams. In most cases, a mixed model would be pursued.

Public bodies can provide valuable pump-priming funds to help create Digital Innovation Hubs. Hubs should be designed to match regional needs (e.g. tourism, agriculture) and their strategies aligned with regional/domain specialisation.

Regions with no existing infrastructure present a particular challenge. Some form of partnering/sponsorship programme may need to be established, where regions work with others with successful Hubs. New Hubs would draw on guidance and support from these other regions and might even set up formal relationships (i.e. become satellite hubs). European funds could be utilised for this and to generally foster collaboration between Digital Innovation Hubs.

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[14] The European Fund for Strategic Investments (EFSI) administered jointly by the EIB and the European Commission as part of the 'Juncker Plan'.

Case Study: The Potential Contribution of the SSP for Industrial Modernisation to Digital Innovation Hubs

A thematic Smart Specialisation Platform for Industrial Modernisation (SSP-IM) was set up by the European Commission in June 2016. This initiative offers support to interregional cooperation based on matching regions with similar smart specialisation priorities related to the modernisation of industry. It is hosted by the Commission's Smart Specialisation Platform located in Seville. The first thematic networks were launched in October 2016.

SSP-IM is a powerful means for positioning, aligning and integrating funding investments for innovation projects. It enables to focus on joint demonstrations, bridging between the early R&D phases and later industrial investments. SSP-IM aims to create an investment pipeline across the EU, by mapping regional strengths and needs, matching them within a value chain, and providing tailored advice and support services. The platform could help regions develop or share infrastructure such as testing facilities, pilot plants, data centres, and Fab-Labs and develop joint investment projects.

The SSP-IM could be a key platform for developing Digital Innovation Hubs. Experience with science parks, for example, shows that the best parks are not simply landlords but complex organisations that play an increasingly important part in local innovation ecosystems. They work extensively with knowledge-based SMEs and start-ups and make valuable contributions to foreign direct investment by high-tech companies.

The SSP-IM could support DIHs through investment in both 'hard' and 'soft' infrastructure, and investment in projects, often as part of a financing mix (multi-level, multi-instrument). The S3 partnerships could be utilised to define user requirements for DIHs and for networked demonstration, again mobilising mixed funding.

See: http://s3platform.jrc.ec.europa.eu/industrial-modernisation

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4. Conclusions and Next Steps

The First Meeting of Working Group 1 brought together, for the first time, stakeholders with interests in running and operating Digital Innovation Hubs as well as potential beneficiaries in industry. As such it marked a milestone in terms of practitioners 'on the ground' taking ownership of this aspect of the DEI initiative, which up to now has focused at political and strategic level.

Key messages from these preliminary discussions were:

- The WG **strongly supports the proposed European network of Digital Innovation Hubs** as a means of supporting business, and especially SMEs and non-technology intensive industry, in seizing the opportunities of digital transformation.

- **Europe has a wealth of knowledge and experience in hub-type initiatives** on which to draw in implementing such a network. At present, however, the available provision is not sufficiently visible either to industry or to other hubs and initiatives. Much greater transparency is required, so as to facilitate both access for companies and mutual learning between service providers.

- Digital Innovation Hubs must **cater for a broad spectrum of needs and as such will have many facets**. They must be agile and demand-led, and build sustainable innovation ecosystems, not just gateways to services. While there can be no one-fit-all approach, Hubs should be united by common values based on independence, a commitment to excellence and customer service, and a proactive, innovative approach.

- Digital Innovation Hubs will need **a clear value proposition that complements, rather than replicates, existing forms of business support**. Core services offered by Hubs should include: sensitizing and visioning around the business potential of digital technologies; working with companies to assess their digital maturity and develop appropriate plans; mentoring and training; and cost-effective access to specialist experimentation and testbeds.

- **In the commercial marketplace, too, Digital Innovation Hubs should not crowd out existing offers**, facilitating access to digital IT SMEs and professional services companies rather than competing against them.

- **Establishing and strengthening a European network of Digital Innovation Hubs** will require, among other measures: mapping service provision and sharing information; building capacity and skills in both breadth and depth; building collaboration between hubs, both physically and online; and creating incentives for SMEs and others to engage with the network. Important issues relating to coordination and governance of the network require further exploration.

- While **a great many investment tools and funding programmes exist**, the best means of mobilising these to meet the requirements of the DIH agenda remains an open question. In particular, further consideration is required on the roles of national/regional versus European funding, and investment approaches for regions with no existing infrastructure.

Discussion at the first meeting focused on defining industry needs, scoping network development and identifying investment requirements for Digital Innovation Hubs. While these start to address the first bullet in the WG's Mandate, further work remains to be done in responding to the questions set out by the Roundtable. In its future meetings and discussions, **the WG should engage more deeply with the issues highlighted in the Mandate**, namely:

- The relationship and synergies between Member States, regions and the private sector in funding the expansion of Digital Innovation Hubs.
- Specific actions necessary to mobilise policy and decision-makers at all levels, including engagement with the private sector and the investment community.
- The requirements for and utilisation of the proposed mapping of Digital Innovation Hubs in Europe.
- Operationalising Smart Specialisation in relation to Digital Innovation Hubs and in particular mechanisms to reach out to less developed regions.
- Reflections on the wider use of public procurement of innovations in the further development and scaling up of digital technologies.

More elaborated responses on these issues will provide a framework for the draft WG report.