

# Strengthening Digital Innovation Hubs with the European AI on-demand platform

## Recommendations White Paper



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## List of Abbreviations

AI	Artificial Intelligence
DEI	Digitising European Industry
DIGITAL	Digital Europe Programme
DIH	Digital Innovation Hub
DTA	Digital Transformation Accelerator
EC	European Commission
ELSE	Ethical, Legal, Social and Economic
H2020	Horizon Europe 2020
HE	Horizon Europe

## List of Figures

Figure 1 Digitising European Industry: An overview .....	6
Figure 2 The European AI Landscape and related projects.....	9
Figure 3 Basic concept of a Digital Innovation Hub.....	10
Figure 4 JRC DIH catalogue.....	11
Figure 5 The New European AI Landscape .....	12
Figure 6 The Evolution of the DIH community .....	13
Figure 7 The Evolution of the AI on-demand Platform .....	14
Figure 8 The AI on-demand platform .....	14
Figure 9 EC concept of a DIH .....	15
Figure 10 EDIH service offerings .....	15
Figure 11 D-BEST and L-BEST service model .....	15
Figure 12 Second level DIH service categories .....	16
Figure 13 Services Categories for Support from the AI on-demand platform .....	16
Figure 14 Recommended Support for DIHs from the AI on-demand platform.....	<b>Error! Bookmark not defined.</b>
Figure 14 Recommended Support for DIHs from the AI on-demand platform.....	18

Table of Contents

*List of Abbreviations*..... 4

*List of Figures* ..... 4

*Background*..... 6

**1. Introduction** ..... 8

**2. The Evolution of DIHs – A brief Overview**.....10

**3. AI on-Demand offerings and DIH services**.....14

**4. Work of Consultation - DIHs** .....17

    4.1. Recommendations for individual supportive services and assets.....18

        4.1.1. Technical Support..... 19

        4.1.2. Ecosystem Support ..... 20

        4.1.3. AI Ethics/Legal Support ..... 20

        4.1.4. Skills Support ..... 21

        4.1.5. Business Support ..... 21

    4.2. Summary of Expert Advice .....22

**4.3. Supporting EDIHs – Complementing the DTA**.....23

**5. Conclusion and Recommendations** .....24

    5.1. Tools and services that would fill gaps and address needs of DIHs.....25

    5.2. Next Steps.....25

## Background

Europe's research and innovation landscape is characterised by its excellence but also by its diversity and uneven development. The area of Artificial Intelligence (AI) reflects these characteristics. To support scientific excellence, and address challenges presented by uneven development, the European Commission has implemented several key R&D&I policies and innovations. Among these actions are the two initiatives, namely the AI on-demand Platform and Digital Innovation Hubs. These bodies and their proposed interaction are the subject of this White Paper.

The AI on-demand platform and ecosystem is an initiative of the European Commission (EC) to support linking activity across European countries focused on the enabling technology of AI. Bootstrapped within a project funded under the Horizon 2020 ICT-2018-26 call<sup>1</sup> — AI4EU —, a supportive platform for testing and experimenting and a catalogue of AI assets were delivered to support the AI needs of European stakeholders.

Another initiative of the EC aimed at fostering the development and adoption of enabling technologies on a regional level is the Digital Innovation Hubs (DIH). These DIHs were introduced as a crucial pillar of the Digitising European Industry (DEI) initiative<sup>23</sup> — see Figure 1<sup>4</sup> — also supporting the uptake of AI in Europe but from a regional dimension. DIHs are meant to serve as one-stop-shops that support companies, in the proximity of the DIH, with their digital transformation by bringing together all relevant stakeholders in the value chain to develop a coherent and coordinated set of services<sup>5</sup>. This support is in the form of providing easy access to the latest digital innovations and experimentation facilities. DIHs thus act as brokers between user companies and technology suppliers and offer support with testing and experimentation with advanced technologies on different market segments but focused on a regional level.



Figure 1 Digitising European Industry: An overview

Given the importance of European Industry and its necessary digital transformation it was crucial to continue efforts in this area and to build on the outcomes of the projects launched under the DEI Initiative. In the multiannual financial framework of the European Union for the period 2021-2027 the EC therefore focused on continuing to support digital transformation and driving key enabling technologies in Europe

<sup>1</sup> Horizon 2020 - LEIT - Work Programme 2018-2020, Information and Communication Technologies

[https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-leit-ict\\_en.pdf](https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-leit-ict_en.pdf)

<sup>2</sup> COM (2016) 180 final, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Digitising European Industry, Reaping the full benefits of a Digital Single Market.

<sup>3</sup> Digitising European industry [https://www.eca.europa.eu/lists/ecadocuments/ap19\\_13/ap\\_\\_digitising\\_industry\\_en.pdf](https://www.eca.europa.eu/lists/ecadocuments/ap19_13/ap__digitising_industry_en.pdf)

<sup>4</sup> Digitising European Industry, an overview,

[https://ec.europa.eu/futurium/en/system/files/ged/digitising\\_european\\_industry\\_the\\_role\\_of\\_digital\\_innovation\\_hubs.pdf](https://ec.europa.eu/futurium/en/system/files/ged/digitising_european_industry_the_role_of_digital_innovation_hubs.pdf)

<sup>5</sup> Roundtable on Digitising European Industry: Working Group 1 - Digital Innovation Hubs: Mainstreaming Digital Innovation Across All Sectors, June 2017 [https://ec.europa.eu/futurium/en/system/files/ged/dei\\_working\\_group1\\_report\\_june2017\\_0.pdf](https://ec.europa.eu/futurium/en/system/files/ged/dei_working_group1_report_june2017_0.pdf)

with complementary programmes: Horizon Europe, Digital Europe, InvestEU and Connected Europe Facility 2.0. As a part of the Digital Europe Programme (DIGITAL), European Digital Innovation Hubs (EDIHs), which are built on the concept of the DIHs, will be funded. These EDIHs, using the experience gained on the regional level with supporting SMEs, midcaps, and public sector organizations, are now funded both from the EC and Member States. A key goal of EDIHs will be to connect hubs and organisations at a European level in cross-border collaborations for the support of their SMEs and the public sector.

The three-year AI4EU project that developed the initial on-demand platform recently ended and the next phase of the initiative is pending. Funding calls under the EC's "Horizon Europe" programme and the new DIGITAL will ensure its positioning as a central pillar in the European AI landscape.

What precisely will be the nature of the relationship and interactions between the pan-European on-demand platform and the regional (E)DIHs? What value can they offer one another? And how will they work together to serve the interests of the respective and sometimes overlapping stakeholders?

To add further complexity to these questions, it is necessary to consider the role and functions of other high-profile existing projects (e.g., EUHubs4Data, DIH4AI etc.), initiatives (AI, Data and Robotics Public to Private Partnership) and programmes (Digital Transformation Accelerator (DTA)) that are closely connected to the AI and DIH ecosystem.

It is precisely the objective of this document to consider the above questions and present a set of recommendations of how both initiatives can best support and complement one another. To develop a robust and considered set of recommendations, under the auspices of the AI4EU project, a group of DIH experts were consulted on how they viewed the current and future landscape and how the interests of stakeholders and the community at large could be best served through the interaction and collaboration between the on-demand platform and current and future (E)DIHs.

This White Paper opens with an introduction on the on-demand platform, the European AI landscape and DIHs. Section 2 presents an overview of the evolution of DIHs. The respective offerings of the AI on-demand platform and the services of DIHs is the focus of Section 3. This is followed, in Section 4, with a presentation of the outputs of work of consultation that focussed on the value AI on-demand platform can offer DIHs in different service categories. Section 5 provides a conclusion with an overview of the key recommendations.



## 1. Introduction

As a part of the effort to digitise European industries and SMEs, the European Commission launched several initiatives focusing on innovation and the use of enabling technologies, such as AI. Some AI specific and related initiatives include ADRA (AI, Data and Robotics Association)<sup>6</sup> which is a partnership focusing on driving acceptance and uptake of AI, Data and Robotics.<sup>7</sup> Another is the Joint Research Centre's (JRC) AI Watch, which monitors AI developments in European Member States including policy initiatives, or uptake and technical developments. On the other hand, new research associations in AI, CLAIRE, Ellis, also emerged, joining existing organizations like the European Association on AI (EurAI), each seeking to foster the cooperation between researchers and AI laboratories with the aim to strengthen and to promote European excellence in AI research. In December 2018, the EC also published its Coordinated Action Plan on AI, which presented its strategy on AI with a focus on increasing investment, making more data available, fostering talent, and ensuring trust<sup>8</sup>. This strategy was then revised in 2021<sup>9</sup>.

The **AI on-demand platform** is a tool to provide AI knowledge — services, training, software and experts — with the aim to support businesses in diverse market sectors to access, use and understand this technology. In addition to the contribution to accelerate the growth of start-ups and SMEs, industry, and public organisations, fostering a successful technology transfer, the ecosystem will also mobilise and support the European AI research community, supporting their needs to produce the necessary research to bootstrap technology transfer and expertise support from all European Member States.

The EC seeks to drive AI in Europe through investments through the European Investment Fund and to ensure that the European values of trustworthy AI are represented and respected through European alliances and expert groups. The framework programme Horizon 2020 (H2020) was the key financial instrument used to support world-class science in Europe, aiming to remove barriers to innovation and an increase collaboration between the public and the private sectors in innovation. AI has been one of the major technological priorities of the H2020 programme. Several projects have been funded driving research and fostering innovation of AI at a European level, but also as seeds for creating an ecosystem that support the cooperation of stakeholders. One of these projects was “*AI4EU, A European AI on-demand platform and Ecosystem*” funded under the Horizon 2020 call ICT-2018-26 as part of the AI on demand strategy. Efforts to drive AI and support science and innovation in Europe continue with the new framework programme Horizon Europe and the DIGITAL Europe Programme.

Figure 2 provides an overview of the position of the AI on-demand in the European AI landscape. Here it is important to mention the four Networks of Excellence on AI — funded under the call ICT-48-2020— on the left-hand side of the AI4EU project, surrounded by a red circle. Also, key are the first six services on different topics connected to the AI4EU project on different topics — funded under the call ICT-49-2020

<sup>6</sup> Commission and industry invest €22 billion in new European Partnerships to deliver solutions to major societal challenges [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_21\\_2943](https://ec.europa.eu/commission/presscorner/detail/en/IP_21_2943)

<sup>7</sup> Draft proposal for a European Partnership under Horizon Europe AI, Data and Robotics Version 18.06.2020 [https://ec.europa.eu/info/sites/default/files/research\\_and\\_innovation/funding/documents/ec\\_rtd\\_he-partnerships-artificial-intelligence-data-robotics.pdf](https://ec.europa.eu/info/sites/default/files/research_and_innovation/funding/documents/ec_rtd_he-partnerships-artificial-intelligence-data-robotics.pdf)

<sup>8</sup> Coordinated Plan on Artificial Intelligence (COM(2018) 795 final) [https://knowledge4policy.ec.europa.eu/publication/coordinated-plan-artificial-intelligence-com2018-795-final\\_en](https://knowledge4policy.ec.europa.eu/publication/coordinated-plan-artificial-intelligence-com2018-795-final_en)

<sup>9</sup> Communication on Fostering a European approach to Artificial Intelligence <https://digital-strategy.ec.europa.eu/en/library/communication-fostering-european-approach-artificial-intelligence>



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This is where the Digital Innovation Hubs (DIHs) come into play. The bodies are positioned to support organizations with their uptake of AI on a regional level. This support is not only in the form of technical support but also through business, legal, data, skills, and ecosystem support. For example, DIHs can provide their clients with use cases and access to infrastructure. Nonetheless, DIHs also support other actors, such as AI solution providers, policy makers, and students. As depicted under the call DT-ICT-02 and in the lower left half of Figure 2, many EU projects have been specifically funded under H2020 to support DIHs on specific technologies, including AI, Data, Robotics, IoT, or market based in areas such as Agriculture, Health, and Manufacturing. The experts consulted for the development of this White Paper are among the coordinators of these key projects.

**Digital Innovation Hubs (DIH)** are an important pillar in the effort to digitise European industry. DIHs first emerged in the DEI and have the purpose of acting as **one-stop-shops that support companies in becoming more competitive by using digital technologies** to improve and transform their business, production processes, products, or services. DIHs support their customers — which can also include **solutions providers, policy makers, or students** — with **testing, piloting, and experimenting** with digital innovations, such as AI by providing **access to expertise, knowledge, and technology as well as business and financing support**. At the core of a DIH very often lies a **Competence Centre (CC)** which is connected to regional partners, such as universities, industry associations, incubators, accelerators, and regional development agencies. Service providers outside the DIHs' region are also often closely linked with the DIH to provide the DIHs' customers with access to their services. The development and support of such DIHs was financed by the European Commission with a budget of 500 million Euros in H2020 to ensure that every European company would have access to a DIH in their region to help them digitise their organisation, products, and services.

## 2. The Evolution of DIHs – A brief Overview

The concept of having a Digital Innovation Hub that could support companies at a working distance in each region of the European territory started in 2013 (start H2020) with the ICT Innovation for Manufacturing SMEs (I4MS)<sup>10</sup> programme, which aimed to support manufacturing SMEs and mid-caps in the use of ICT<sup>11</sup>. I4MS started creating networks of Competence Centres (CCs) that could support SMEs at a regional level through funded projects. These CCs mainly focused on developing innovative technologies and supporting the industry in exploiting these technologies for products and processes, such as manufacturing. However, they lacked a focus on support in other crucial areas for SMEs, such as business



Figure 3 Basic concept of a Digital Innovation Hub

services. This concept of supportive networks of CCs was therefore further developed to include business aspects so that SMEs could be offered an integrated approach. A part of this new development was the I4MS call for proposals to develop business plans and feasibility studies for Regional Digital Manufacturing Innovation Hubs (RDMI-hubs), which later evolved into Digital Innovation Hubs. These DIHs complemented the CCs by offering expanded technological services, support to find investment and the necessary skills, adding business-oriented services, and boosting collaboration on a regional level<sup>12</sup>. The basic concept of a DIH is pictured in Figure 3, showing the different actors and activities that can be represented within a DIH, including having an Orchestrator as the core part of the DIH. This

<sup>10</sup> I4MS Initiative: <https://i4ms.eu/>

<sup>11</sup> C. Sassanelli et al. Towards a Reference Model for Configuring Services Portfolio of Digital Innovation Hubs: The ETBSD Model, 2020; <https://re.public.polimi.it/retrieve/handle/11311/1167125/603705/Sassanelli%20et%20al.%20-%202020%282%29.pdf>

<sup>12</sup> DIHNET working paper on Defining Digital Innovation Hubs as part of the European DIH network, <https://www.ip4fvg.it/wp-content/uploads/2020/06/DIHNET-Defining-the-DIH-in-its-context-FINAL.pdf>

orchestrator coordinates the different activities and can be a partner organisation (often an RTO), but also private consultancies or public authorities. In 2015, DIHs were proposed as one of the pillars in the DEI initiative, co-developed between the European Commission (DG Connect) and the Member States<sup>13</sup>. The DEI strategy also included the Smart Anything Everywhere (SAE)<sup>14</sup> program that commenced in 2015. It aimed to create consolidated ecosystems around regional DIHs in four different technology areas.<sup>11</sup> The DIH concept was further refined in working groups and support from the EC in the form of projects covering different technology and application areas, such as agri-food and health, in financing, and other initiatives. Local/regional DIHs were positioned as the first contact point of organisations interested in digitisation and new technologies and can therefore be considered the gateway to regional support.

The widely acknowledged need for such hubs to support the diffusion and adoption of cutting-edge innovation and technology is reflected in the increasing number of DIHs in Europe.<sup>13</sup> The Joint Research Centre (JRC) has established a DIH catalogue, depicted in Figure 4.<sup>15</sup>, that provides a comprehensive overview of DIHs and their competences, structures, and service offerings a pan-European network of different regional DIHs. The requirements for being eligible as a DIH in the catalogue were initially as follows<sup>16</sup>:

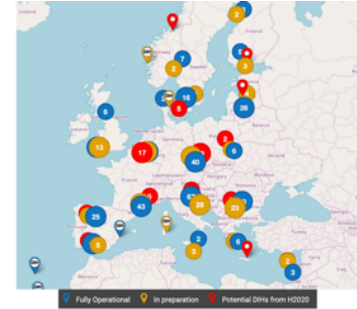


Figure 4 JRC DIH catalogue

- being part of a regional, national, or European policy initiative to digitise industry
- being a non-profit organisation
- having a physical presence in the region and present an updated website explaining the DIH's activities and services provided for the digital transformation of SMEs/Midcaps
- having at least three verifiable examples of how the DIH has helped a company with its digital transformation

As previously described in Figure 2, DIHs have been supported under the umbrella of the DEI Initiative in H2020 projects. While their support from several ongoing projects continues, H2020 has come to an end, shifting the focus to the new supportive programmes. For the period from 2021-2027, the EC's new Framework Programme for Innovation, Horizon Europe (HE)<sup>17</sup>, and the complementary DIGITAL Programme<sup>18</sup> will not only provide new opportunities for AI initiatives, research, and industry but will also directly support DIHs. DIGITAL will support the creation of a network of European Digital Innovation Hubs (EDIHs) and HE will offer opportunities to fund services provided by DIHs to continue with activities started in H2020 directed towards companies that work together with DIHs to experiment and test with novel digital solutions to improve their businesses.<sup>19</sup>

<sup>13</sup> DIHNET Paper "Specialization and collaboration in the European Network of DIHs:

<https://zenodo.org/record/4636460#.YcyDKFxnD5>

<sup>14</sup> Smart Anything Everywhere Initiative: <https://smartanythingeverywhere.eu/>

<sup>15</sup> Digital Innovation Hubs Catalogue <https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>

<sup>16</sup> Smart Specialisation Platform, Digital Innovation Hubs Catalogue, <https://s3platform.jrc.ec.europa.eu/en-US/dih-catalogue>

<sup>17</sup> [https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe\\_en](https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en)

<sup>18</sup> [https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/digital-europe-programme\\_en](https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/digital-europe-programme_en)

<sup>19</sup> Digital Innovation Hubs as policy instruments to boost digitalisation of SMEs, JRC 121604, <https://publications.jrc.ec.europa.eu/repository/handle/JRC121604>

In the Commission Work Programme 2022<sup>20</sup>, the EC outlined the next steps towards realising a more digital economy that will digitally transform the EU by 2030. As outlined in Figure 5 these new plans for digitising Europe also include new funding opportunities under HE and DIGITAL, which aim to boost Europe's digital transformation for example by focusing on Best Use of AI. In these programmes, the EC will continue to seek to counteract fragmentation of AI in Europe and sets out to connect DIHs through a pan-European network of DIHs. As a part of DIGITAL, some existing DIHs will have the opportunity to apply to become EDIHs, which will ensure a wider use of digital technologies across the European and national economy and society. Many DIHs however, despite opportunities to receive a seal of excellence, will require support from either their Member States and regions or from other sources. For the AI on-demand platform there will be the opportunity to offer support to both the DIHs and the EDIHs, either in a direct way (DIHs) or indirect (EDIHs). EDIHs will receive dedicated support from the Digital Transformation Accelerator (DTA) in charge of providing support to the whole EDIH network. Future EDIHs will thus play a great role in the effort to counteract fragmentation and building pan-European connections.

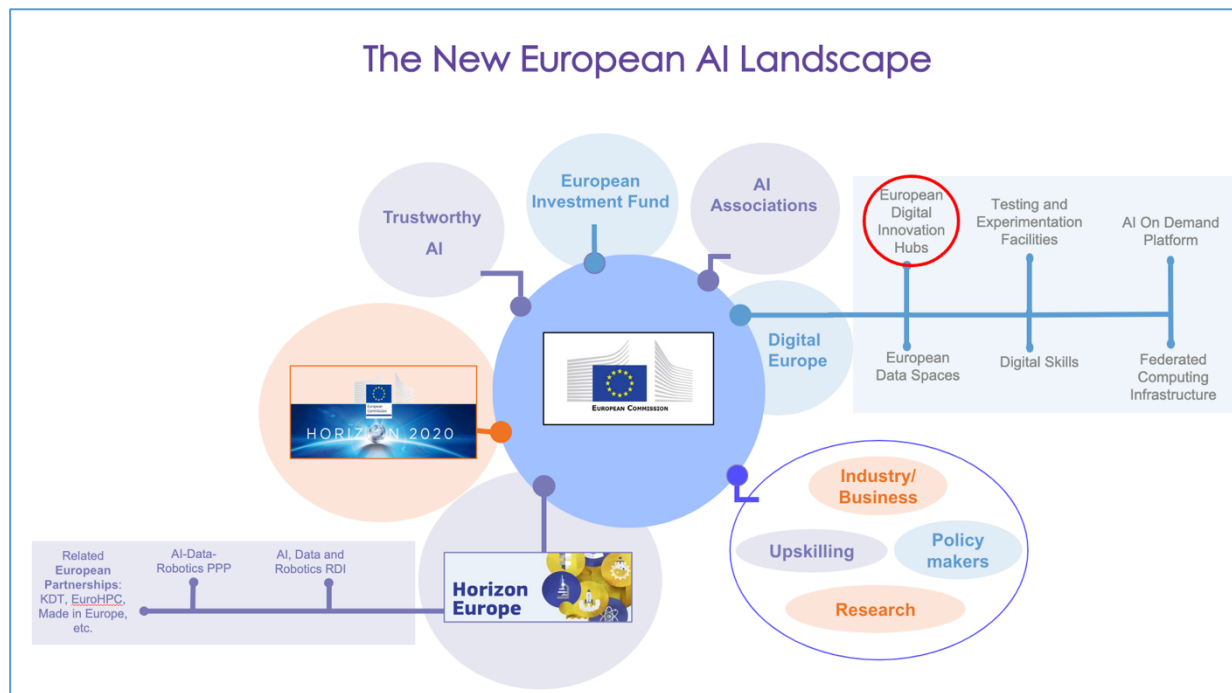


Figure 5 The New European AI Landscape

<sup>20</sup> Commission Work Programme 2022 (COM(2021) 645 final), [https://ec.europa.eu/info/strategy-documents/commission-work-programme/commission-work-programme-2022\\_en](https://ec.europa.eu/info/strategy-documents/commission-work-programme/commission-work-programme-2022_en)

Figure 6<sup>21</sup> provides an overview of the evolution of the DIH community as well as the concept of CCs, DIHs, EDIHs and Pan-European DIH Networks. It also shows how CCs and DIHs support end-users (SMEs) on a more regional or local level, whereas EDIHs additionally act as a bridge to connections on a European level. As the timeline in the figure shows, the increasing number of DIHs over the years lead to the necessity of more European-level connections and collaboration.

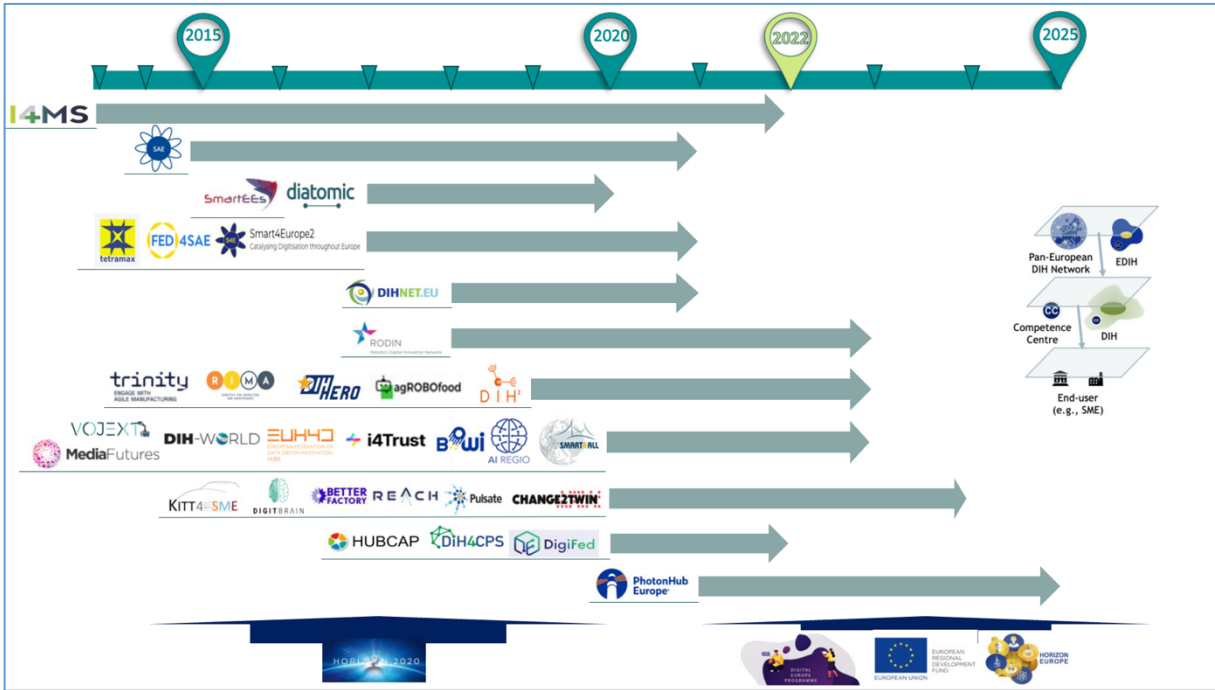


Figure 6 The Evolution of the DIH community

**European Digital Innovation Hubs (EDIHs)** will remain one-stop-shops that support companies with the use of digital technologies by providing access to technical expertise, experimentation, training and skills development, and innovation services, such as financing advice. However, they will play a new greater role as drivers of increased and broader uptake of digital technologies, such as AI by industry, with a **focus on SMEs and midcaps, and European public sector** organizations and **improving the sustainability** of their processes and products. In comparison to previous DIHs, EDIHs will also **focus on energy consumption and reduction of carbon emissions**. Moreover, EDIHs will have a clear European added value and counteract fragmentation of e.g., AI in Europe by **promoting transfer of expertise and connecting different hubs and organizations**. The capacity of EDIHs and services provided to their customers will also be **strengthened through investments in equipment, facilities, and employees**.

<sup>21</sup> Adapted from *The Evolution of the DIH community* from TNO and DIHNET

<sup>22</sup> Digital Europe – EDIH Work Programme 2021-2023: <https://digital-strategy.ec.europa.eu/en/activities/edihs>

### 3. AI on-Demand offerings and DIH services

As shown in Figure 7, the existing AI on-demand platform was initially developed by the AI4EU project under the Horizon 2020 ICT-26-2020 call. The projects funded under the Horizon 2020 calls ICT-48-2020 and ICT-49-2020 continue to develop and add value to the platform. An important consideration is that the DIGITAL project for the AI on-demand platform will likely not be launched until 2024. The Horizon Europe project funded under CL4-2021-HUMAN-01-02 with a budget of EUR 9 million, will therefore bridge this gap by leading the continuation of the platform.

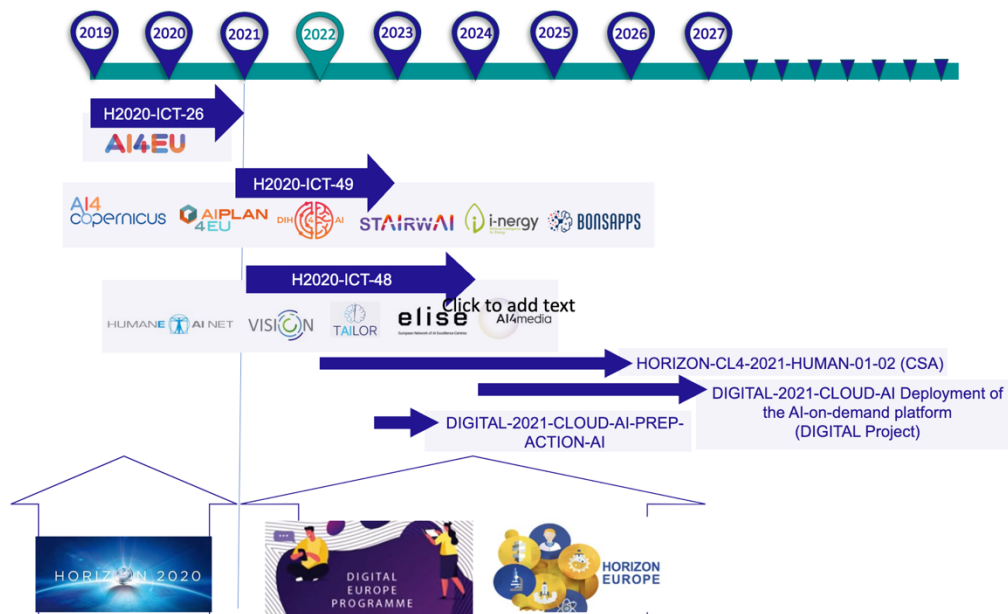


Figure 7 The Evolution of the AI on-demand Platform

The current AI on-demand platform ([ai4europe.eu](https://www.ai4europe.eu/)), presented in Figure 8, offers a range of assets and tools. For one, it provides access to an **ecosystem** of AI-related researchers, developers, industry partners, and European projects and initiatives. The dedicated AI Community section of the platform enables users to find information on key actors in AI in Europe and to connect with them. On a **business** and industry level, the platform provides support through information on **funding** opportunities through open calls as well as AI case studies. In a section dedicated to research, the platform offers outputs of research projects and **technical** tools such as ML models or data sets. The education section of the platform provides a catalogue of AI education resources, such as tutorials and European education Initiatives to foster AI-related **skills**. The platform also provides an insight into Ethical, Legal, Social and Economic (ELSE) issues of AI, as well as support in these areas in a dedicated section on **ethics**. Lastly, in addition to updates and informative web cafés in a News and Event section, the platform also offers an Experiments platform for AI solutions that also facilitates technical testing.

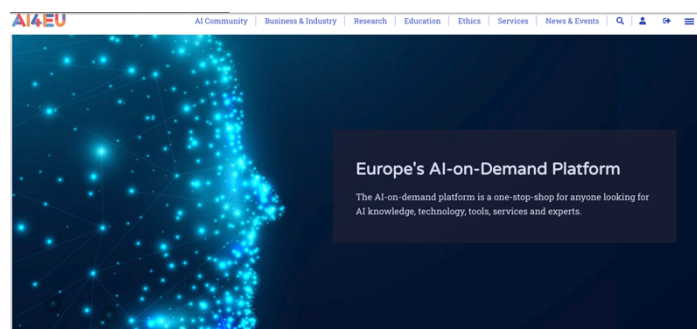


Figure 8 The AI on-demand platform



To categorise the services of DIHs, three initial categories were defined, Ecosystem-Technology-Business<sup>11</sup>. Based on these initial three categories, European level efforts to describe the DIH offering in DIH Working Groups, led to the addition of another service category, namely Skills<sup>23</sup>. It was, however, clear that “a DIH will only be able to provide direct, first line support to SMEs in a limited number of technologies or sectors.” And for other questions they might need support from other institutions inside or outside the region.<sup>13</sup>

Figure 9<sup>24</sup> shows the service categories the EC considered to be the core services of DIHs. The general service categories of DIHs are somewhat aligned to the different categories of assets of the AI on-demand platform. Like the core services of the AI on-demand platform, some of the main areas of support considered here are in skills, ecosystem support, financial support and technical support, such as in testing and experimentation.



Figure 9 EC concept of a DIH



Figure 10 EDIH service offerings

These services are also reflected in the four types of services envisioned for the new EDIHs in DIGITAL<sup>13</sup> – see Figure 10. With respect to DIHs focusing on AI, the specificities of these types of DIHs were examined<sup>25</sup> and the service offerings aligned to the categories for EDIHs defined in DIGITAL and the JRC DIH Handbook. In parallel, the categories were finetuned and extended within different H2020 projects.

A service model of DIHs in AI that originates from categorization efforts of previously mentioned projects and organisations is the D-BEST and L-BEST Service Model (Figure 11). The services described in these models were delivered in an effort to help customers adopt new technologies and digitally transform. They are categorized into data services, business services, ecosystem services, skill services, technology services and legal and ethical services. The detailed service categories can be more complex and vary depending on the abilities, needs and



Figure 11 D-BEST and L-BEST service model

<sup>23</sup> Digital Innovation Hubs: Mainstreaming Digital Innovation Across All Sectors

[https://ec.europa.eu/futurium/en/system/files/ged/dei\\_working\\_group1\\_report\\_june2017\\_0.pdf](https://ec.europa.eu/futurium/en/system/files/ged/dei_working_group1_report_june2017_0.pdf)

<sup>24</sup> Digitising European industry - The role of Digital Innovation Hubs (DIHs), Anne-Marie Sassen, Deputy Head of Unit Technologies & Systems for Digitising Industry, DG CNECT/A2, European Commission

<sup>25</sup> Blueprint for cross-border collaboration among DIHs

<https://d1dxeyimx6ufk.cloudfront.net/uploads/NA5/OD8012/F445A87B.pdf>

focus area of a DIH. An example for a potential second level categorisation of the DIH service categories can be found in Figure 12.

<b>Ecosystem</b>	EU-community building	<b>Technology</b>	Align/synchronize technologies
	EU-strategy development		Organizing pan-EU research
	Strategic EC advice		Aligning regional RDI investments
	Collaborative EU awareness creation		Pan-EU scouting RDI collaboration
	EU wide promotion and representation		Technology trendwatching
	Mapping the ecosystem		Technology assessment
<b>Business</b>	Initiating interregional collaborations	<b>Skills</b>	EU access to available expertise
	Development of EU-proposals		Joined EU training of industry/research
	Individual RDI business support		Train the trainers
	Initiate interregional corridors		Pan-EU policy training
	Access to finance for EU-collaboration		Skills information repository
	Centralised digital maturity assessment		Standardization of certification

Figure 12 Second level DIH service categories

The models of the service offerings of DIHs and future EDIHs also differ slightly. The main difference between EDIHs and DIHs with regards to services is that for DIHs highly innovative application experiments were funded whereas the role of EDIHs is rather to do the roll-out to help all SMEs and also public service organisations. They will also have a focus on higher TRL levels than the existing DIHs. In addition to that, the EDIHs are bound in terms of service categories as well as in terms of technology areas as defined in DIGITAL.<sup>19</sup>

The DIH service categorisation has also been applied to DIHs focusing on different technologies, such as AI<sup>25</sup>. In this suggested model, the AI DIHs would assist their clients by providing technical support on scaling up with testing and validation. AI DIHs also supports their clients with finding investments, for example by assessing AI maturity or providing access to data ecosystems. Furthermore, to support their clients with ecosystem building and networking, AI DIHs offer support including ecosystem scouting. Lastly, as portrayed by the skills and training service category, AI DIHs will offer services including courses on AI or talent search.

The key focus of this White Paper is to consider how the European AI on-demand platform should support DIHs and EDIHs in the future and how to include all DIHs to avoid exclusion and fragmentation. Using more detailed categorizations was unsuitable to achieve this as this would have required assessments tailored to specific DIHs. It was therefore decided that using a more general categorisation would be more suitable and the D-BEST and L-BEST Service Model and platform categories were chosen as a base for analysing how the AI on-demand platform could support DIHs. The service categories used for examination of platform offerings are presented in Figure 13.

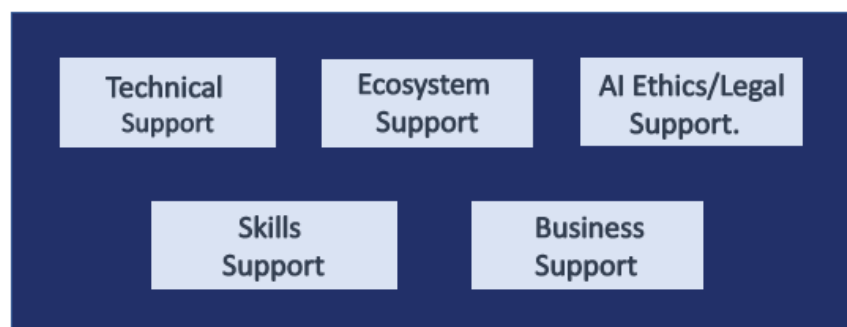


Figure 13 Services Categories for Support from the AI on-demand platform

## 4. Work of Consultation - DIHs

Developing the technical AI on-demand platform was a key focus of the AI4EU project. However, a complementary objective was to build a supporting European AI Ecosystem. A focus of the activities of the project was therefore also to build connections amongst the different stakeholders in AI in Europe and forming Working Groups to drive innovation and collaboration across Europe. As a part of this ecosystem-building activity a Working Group was formed with DIH experts involved in multiple DIH projects across Europe. This Working Group of DIH experts examined the needs of DIHs in the field of AI and explored opportunities for collaborations and support from the AI on-demand platform. This White Paper was a result of these activities.

This work of consultation sets out to explore how the AI on-demand platform, that will be continued with DIGITAL and Horizon Europe, could best support DIHs and EDIHs in the field of AI without replicating DIH services and support offered by the DTA. Experts agreed that the AI on-demand platform would best support DIHs in offering AI-related services on a European level, as DIH already focus on services on a regional level. This means that the AI on-demand platform would focus on developing and bringing together AI-related services spread across Europe to make them more easily accessible across different regions.

The results of the work of consultation will be presented in a form of recommendations that have been developed using a top-down-approach and expert analysis. The top-down-approach begins by exploring what the future AI on-demand platform could generally offer DIHs by examining potential offerings in different service categories - **technical support, ecosystem support, AI ethics/legal support, skills support, and business support**. In the next step these individual potential offerings are examined by determining whether they would duplicate DIHs' existing services and whether they would provide real value to DIHs. For this value assessment and to determine the best and final version of recommendations, expert opinions were collected in three workshops with DIH experts that have years of experience in supporting and building DIHs. These experts analysed all potential areas of support in terms of which of these potential offerings of the platform could provide the most value to DIHs without duplicating services. Furthermore, experts emphasized the importance of targeting all DIHs, including EDIHs but ensuring that existing support, such as the DTA for EDIHs, is considered when developing the recommendations. Section 4.3 therefore examines how the AI on-demand platform could support EDIHs by complementing the DTA.

### An Overview of the current landscape of the DIHs

While DIHs can focus on different types of technologies, it is the DIHs focusing on AI that the AI on-demand platform should mainly target to offer support. Nonetheless, the platform should not limit itself to these DIHs as others in different sectors may also benefit from AI solutions in combination with other technologies. As of December 2021, there are 698 DIHs in the JRC catalogue<sup>26</sup>. Filtering the DIHs in the JRC DIH catalogue by the category AI results in 437 DIHs. Despite there being many AI DIHs in the JRC catalogue, only some of these are well equipped to provide support in AI. Other DIHs that fall under the AI category lack services in some areas and could therefore especially benefit from the support of the AI on-demand platform. This was also highlighted by the analysis of applicants for mentoring and coaching from the AI DIH Network project. This analysis found that out of 150 AI DIH applicants only about 40% of

<sup>26</sup> Digital Innovation Hubs Catalogue <https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>

these applicants provided strong support in AI. Furthermore, the JRC catalogue<sup>26</sup> shows that out of 328 total EDIH candidates there are 131 EDIH candidates in AI. As only 200 EDIHs will be chosen and the EC intends to have a representation of all key technologies in the EDIHs, it is likely that many of these applicants, especially in the field of AI will not succeed in becoming EDIHs and will instead require alternative support. This provides the AI on-demand platform with an opportunity to offer significant support to DIHs, and especially DIHs, that are not selected as EDIHs and may need additional support. The future European AI landscape and the predicted changes for DIHs, including the development of EDIHs emphasize that the focus should not just lie on DIHs that do not become EDIHs and will need more support. It should also lie on connecting the EDIH and DTA ecosystem with DIGITAL and HE AI technologies and capacity building through the AI-on-demand platform. Ensuring that the AI on-demand platform can offer AI assets, services and more mature products with higher TRLs that would be of value to EDIHs therefore remains of great importance. What should also be considered for the recommendations is that while DIHs require more lower-level support regarding TRL, EDIHs will require more higher-level support in the form of ready-to-use solutions.

This work of consultation opens with recommendations for individual service and asset offerings the future AI on-demand platform is recommended to provide to DIHs in each of the service categories (4.1). This is followed by an overview of expert recommendations the AI on-demand platform should consider (4.2). Section 4.3 examines how the DTA plans to support EDIHs and how the platform can complement this support. The work of consultation closes with an overview of the final recommendations on how the future AI on-demand platform could best support DIHs can be found in Section 5.

#### 4.1. Recommendations for individual supportive services and assets

This section examines each of the service categories to determine which specific services and assets could fill gaps and satisfy needs of DIHs on the AI on-demand platform. Each service category opens with a figure (Figure 14) that provides an overview of the services and assets the AI on-demand platform is recommended to offer. This is followed by a justification of these recommendations based on the top-down-approach consisting of services and assets the platform could potentially offer followed by an

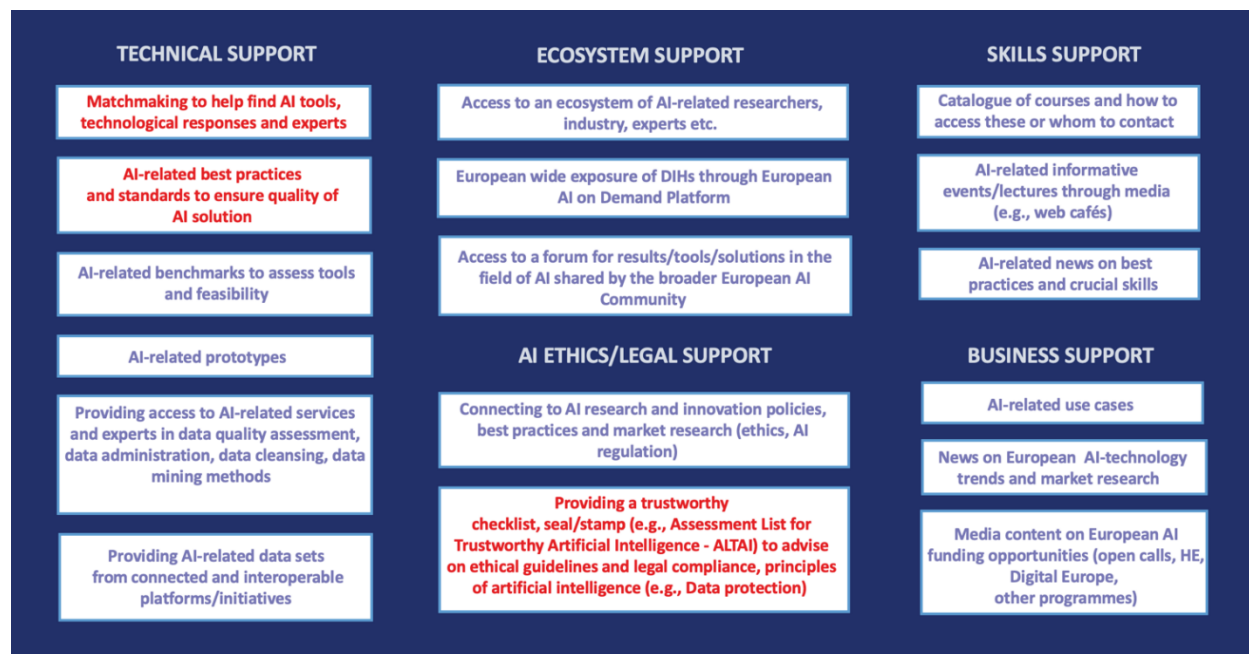


Figure 14 Recommended Support for DIHs from the AI on-demand platform

expert analysis of these offerings. The **recommended offerings** highlighted in red are the areas where the AI on-demand platform could provide the most support.

#### 4.1.1. Technical Support

##### Offerings considered

- In this service category, *technical support*, the AI on-demand platform could support DIHs by providing tools and resources that could aid customers of DIHs with **AI solution development, technical challenges and testing and validation**.
- Regarding **data services**, the platform could offer support to DIHs by assisting with data acquisition, data processing, and data analysis.
- The platform could assist DIHs by providing data sets from connected and interoperable platforms and initiatives, as well as by providing access to services and experts in data quality assessment, data administration, data cleansing, data mining methods.
- To support DIHs in assisting their customers with **technical challenges and testing and validation**, the platform could provide AI-related benchmarks to assess tools and feasibility. The platform could also offer its support by providing tools and other digital technologies for AI-related testing in an experimentation and sandbox service section.
- Additionally, the platform could support DIHs by offering matchmaking tools to identify needs and technological responses to fill technological gaps and find suitable AI experts to provide solutions.
- The platform could dimension hardware requirements and link to providers and provide access to the upcoming testing and experimentation facilities (TEFs) in DIGITAL.

##### Expert analysis of potential offerings

Experts argued that dimensioning hardware requirements and linking to providers or providing tools and other digital technologies for AI-related testing in an experimentation and sandbox service section of the platform would not provide much additional value to DIHs. These are services DIHs partially already provide themselves. Services in data, regulation and policy on the other hand would be quite valuable. The focus with regards to data support should be on more data-driven AI services, AI models, experiments, and results in the form of new datasets. Overall, the role of the AI on-demand platform in relation to data services should focus on the provisioning of high-level services related to data driven AI. It was also argued that quality assurance methodologies and access to European level infrastructure, such as TEFs or initiatives (other networks or data spaces) would be of significant value.

#### 4.1.2. Ecosystem Support

##### Offerings considered

- In the service category, *ecosystem support*, the AI on-demand platform could offer services and tools to support DIHs such as cooperation models, and networking space to find sponsors for events or workshops.
- The platform could also provide access to an ecosystem of researchers, industry, AI experts etc., and a forum for sharing results, tools, and solutions from the broader European AI community.
- Communications strategies to reach target audiences (SMEs, public authorities etc.) were also considered as potential offerings.
- The platform could also support DIHs in this service layer by offering European wide exposure for DIHs and access to a broad range of communications channels.
- The platform could increase collaboration and raise awareness of DIHs through a dedicated space on the platform that enables DIHs to connect, exchange and combine expertise amongst themselves but also with other AI-related stakeholders
- An overview of, and access to, existing initiatives and capacities such as TEFs or European Data Spaces could be provided.

##### Expert analysis of potential offerings

Experts agreed that access to key actors of the ecosystem of the AI on-demand platform, European wide exposure of DIHs and a forum for results, tools and solutions would provide the most value to DIHs without duplicating existing services. Experts also agreed that it was of great importance to ensure the platform provides an overview of existing initiatives, projects, and capacities and to link to these on the platform. A crucial recommendation from experts in this regard was to avoid competition with the DTA, and to launch a synergy strategy as early as possible.

#### 4.1.3. AI Ethics/Legal Support

##### Offerings considered

- In the area of **ethical AI**, the platform could support DIHs by offering advice on ethical guidelines and legal compliance as well as the principles of AI. This support could be offered in the form of facilitating the access to AI legislation training courses and a trustworthy checklist aligned to the Assessment List for Trustworthy Artificial Intelligence (ALTAI) and the EC's legal framework on AI<sup>27</sup>.
- Some legal and ethical services the AI on-demand platform could assist with are support with ensuring high standards and quality, and compliance with ethical and legal guidelines.

##### Expert analysis of potential offerings

Experts recommended that the focus of AI Ethics and Legal support should be on the AI regulatory framework but should also consider data sharing and governance. Experts also

<sup>27</sup> Regulatory framework proposal on artificial intelligence <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai>



argued that advice on ethical guidelines and legal compliance would be of great value to DIHs. This support should include easy access to information on how to implement AI legislation and facilitating the access to AI legislation training courses.

#### 4.1.4. Skills Support

##### Offerings considered

- In the service category, *skills support*, the AI on-demand platform could provide a catalogue of courses, best practices for teaching AI skills, recruitment services including job offerings and demands
- The platform could also provide research documents and materials that could be used for AI training and education, and upskilling opportunities.
- The platform could connect AI coaches and users and host informative events/lectures through media (e.g., Web Cafés).

##### Expert analysis of potential offerings

DIH experts argued that recruiting services would duplicate existing DIH services and along with research documents and materials for AI training and education should therefore not be offered on the AI on-demand platform. Instead, existing sources as well as initiative and projects with these services should be linked to the platform. Experts recommended informative events and lectures, and a catalogue of courses organised per AI skills profiles be offered by the platform. Such a catalogue would ideally also include upskilling opportunities, and information about professions related to AI and the skills, and competencies necessary to implement such. Links to the Skills and Jobs Coalition and ESCO skills would also provide real value to DIHs. A recent report on the competences of AI specialists<sup>28</sup> shows that data mining, machine learning (ML) & data management are crucial skills in AI, but that industry and experts often lack competences in AI & Ethics and Data Mining & Machine Learning. Thus, a focus on data mining, ML and Ethics-related skills should be considered, for example by linking to existing support in these areas and aligning with existing projects that offer this support.

#### 4.1.5. Business Support

##### Offerings considered

- To facilitate **AI solution development** for DIHs the platform could provide use cases organised per sector, success stories, innovation practices, user journeys, prototypes, feasibility frameworks, cost examples, quality assurance methodologies and best practices for comparison.
- The platform could also support DIHs with AI solution development by connecting DIHs to AI research and innovation.
- Regarding **support to find investments**, the AI on-demand platform could provide a networking space to find funding and sponsors. It could also provide DIHs with news on European AI funding opportunities, such as Open Calls, HE, DIGITAL and other programmes.

<sup>28</sup> Ergebnisse Der Online-Umfrage „Kompetenzen Von KI-Fachkräften“ <https://www.karlsruhe.ihk.de/fachthemen/uebersicht-ausbildung/ki-b3/online-umfrage-kompetenzen-von-ki-fachkraeften--5223226>

- The AI on-demand platform could offer an AI maturity assessment and an AI service impact assessment.
- The platform could also provide DIHs with news on AI technology trends and market research.

### Expert analysis of potential offerings

Examining potential offerings regarding *support to find investments* in the business category, experts argued that much of the aforementioned potential offerings related to investment support would duplicate existing services of DIHs. Instead, news and updates related to AI and EU visibility to local innovative AI SMEs and start-ups would be the most valuable service the AI on-demand platform could offer in this service category. Furthermore, experts argued that matchmaking tools to find AI experts and fill technological gaps, AI use-cases, market research and trends would be of great value.

## 4.2. Summary of Expert Advice

The key areas where DIHs can extensively benefit from services from the AI on-demand platform and where the platform would add great value on a European level are more political services at EU level in the areas of legal, ethics, standards, skills, and support services. In addition to providing the analyses above for each service category, the DIH experts that were consulted emphasized the importance of studying the current AI on-demand marketplace and how DIHs are positioned within this marketplace to acquire a deeper understanding of the needs and gaps of DIHs.

An analysis of the marketplace showed that some gaps included an understanding of SME needs, a reference point for information, integration and alignment, efficient EU-wide collaboration, and awareness. The analysis also found that the DIH ecosystem lacked a central site where DIHs working with AI could meet, learn, connect, exchange, discuss, matchmake, combine expertise, and receive policy support and an overview of existing capacities such as existing projects and networks. As a reference point for information, a pool of strategic European AI tools, services and expertise, and a site for exchange and community building the future AI on-demand platform could thus fill DIH gaps by integrating and aligning European and regional AI-related offerings.

It could offer assessment, and benchmarking, and raise awareness of these offerings as well as of the organizations offering them. Some projects are working on extending the service offering for existing services on the AI on demand platform. This coordination and central point for sharing is also being explored by the BDVA i-Spaces and EUHubs4Data project. Both concepts are closely related in the sense that EUHubs4Data is materializing the collaboration among the i-Spaces, towards a European federation of data driven innovation hubs.

ADRA could lead similar actions in the future. Close collaboration with the projects extending the AI on demand platform, ADRA, BDVA are therefore crucial for the future for the platform on many levels.

To ensure the success of such a central site, it is also crucial for DIHs to have a dedicated space within the platform where knowledge can be distributed to several DIHs in one compact space and to ensure that the platform is easy to navigate and provides an on-boarding strategy.

Moreover, experts argued that it is vital for the AI on-demand platform to have clear value propositions for DIHs to ensure their engagement. As a part of such a value proposition experts believe that quality

assurance through the promotion and dissemination of good practices and usability testing on the AI on-demand platform would provide real value to DIHs. Experts also agreed that matchmaking tools or services to find AI assets such as experts, specialized tools or solutions on the AI on-demand platform would aid DIHs in filling gaps, identifying needs, and supporting their customers. It was also emphasised that for EDIHs it was vital that solutions offered by the AI on-demand platform should be market-ready.

Lastly, establishing **synergies with the DTA** before the DTA and DIGITAL AI on-demand platform are launched will be crucial. The DTA will be a project strongly driven by the EC and it is fundamental that the synergy among the services delivered by the two platforms is not duplicated. To address this matter, the next sub-section provides an overview of the DTA services for EDIHs and how the AI on-demand platform may still support EDIHs without duplicating these services.

While expert recommendations focused on how the AI on-demand platform can provide value to DIHs, it was also briefly explored how DIHs can provide value to the platform. A summary of the results of this discussion can be found in the box below.

While identifying which valuable services and assets the AI on-demand platform can offer DIHs is the focus of this recommendation, DIHs can also bring value to the AI on-demand platform. By offering or providing access to AI-related tools, services, experts, and other AI-related assets on the AI on-demand platform DIHs would not only increase their visibility and thereby gain additional customers, but they would also directly contribute to the EC's strategy for counteracting fragmentation of AI in Europe by consolidating their AI-related services in the AI on-demand platform. The contribution of DIHs to the AI on-demand platform would also facilitate platform users finding the right resources and connecting with the right experts on AI-related service providers would increase the pool of experts and organisations to choose from on the AI on-demand platform.

### 4.3. Supporting EDIHs – Complementing the DTA

The DTA will support EDIHs will DTA in five main areas. These are community building, training, connecting to relevant initiatives, impact assessment and road mapping, and online presence, external communication, tools, and support<sup>29</sup>.

The community building service of the DTA focuses on support tools such as good practices, providing training services and material and support with organising events for matchmaking as well as outreach to all relevant European initiatives. The DTA must provide access to all online resources via a multilingual platform also managing the catalogue of the EDIHs.

For the AI on demand platform, it is important, to identify the “gaps” of the DTA with respect to AI before making direct connections to the EDIHs, also via the DTA, as the DTA also aims to help hubs to get in touch with the relevant organisations and people. DIHs as well as EDIHs may benefit from training and

<sup>29</sup> Digital Europe – EDIH Work Programme 2021-2023: <https://digital-strategy.ec.europa.eu/en/digital-europe-programmes-multiannual-work-programme-european-digital-innovation-hubs-2021-2023>

workshops on the AI on-demand platform, as the DTA will support collaboration with other actors to provide training. Avoiding duplication of these services should therefore be a priority of the platform. The impact and assessment road mapping category of the DTA refers to the collection and analysis of the key performance indicators of the EDIH. Regarding support from the DTA in the category of online presence, external communication, tools, and support, the DTA will provide a multilingual web portal linking to all the relevant online resources. Most of these resources will focus on digital transformation and provide detailed support and resources in AI, in addition to other technologies, could become a challenge for the DTA. The AI on-demand platform may therefore be able to offer EDIHs more detailed support in AI but should first examine the offerings on the DTA platform. The APIs developed for multilingual interaction and matchmaking on the AI on-demand platform may also provide value to the DTA when developing its services on its platform. As a contact point to connect with EDIHs the AI on-demand platform should reach out to the DTA which will lead external communications and the media presence for the network of EDIHs.

## 5. Conclusion and Recommendations

Based on the identified gaps and needs of DIHs, the services and tools the AI on-demand platform can provide, and based on the feedback gathered from DIH experts, a final set of recommendations has been identified.

It is important to consider that DIHs will need a space to connect with the European AI community to provide SMEs and public administration access to AI tools and assets. The existing AI on-demand platform will therefore play a crucial role in ensuring such a space for DIHs exists until the DIGITAL project is established. Moreover, these recommendations should also be considered in the DIGITAL project to ensure it avoids duplication of the offerings of the DTA and delivers value with, or in addition to, existing initiatives or new services that emerge over the forthcoming period.

This set of recommendations consists of the following two main topics:

- Recommended tools and services that would fill gaps and address needs of DIHs
- Next Steps

The focus of the topic ***Recommended tools and services that would fill gaps and address needs of DIHs*** in section 5.1 lies on recommendations for what specific offerings, such as tools, the platform could provide that would provide value to DIHs.

The existing platform can be further developed to provide additional value to DIHs. Section 5.2 ***Next Steps*** therefore makes recommendations to ensure the platform is a central site where DIHs can connect and share expertise, tools, and services related to AI. A part of this is ensuring DIHs are attracted to the platform, encouraged to use it, and that the platform provides value to both DIHs and EDIHs without duplicating offerings of the DTA. These recommendations should especially be considered for the continuation and further development of the existing AI on-demand platform. This platform will need a strategy to encourage collaboration and engagement, for which these recommendations can provide support.

### 5.1. Tools and services that would fill gaps and address needs of DIHs

Before encouraging engagement, it is essential to ensure that the platform provides value to DIHs. It is therefore crucial to first consider which tools and assets could provide real value to DIHs. As described in detail in Section 4, the AI on-demand platform can support DIHs in multiple areas with a special focus on business support and testing, data services, ecosystem services, and legal and ethical services. Overall, all services that implement the European way to AI, and differ from individual countries' approaches will provide value to DIHs, specifically in the areas of legal, ethical, skills, standards, privacy, and confidentiality. The following support from the AI on-demand platform for DIHs is recommended:

- Provide a collaborative space for results, tools, and solutions and to connect with the AI ecosystem
- Support DIHs with enforcing AI ethical guidelines by providing and regularly updating information on AI-related policies, legal guidelines, and best practices on the AI on-demand platform (e.g., checklist)
- Support DIHs with identifying required AI-related tools, services, and partners through matchmaking (this could also incorporate a users' activity in the collaboration space)
- Link to existing initiatives, tools and platforms and ensure seamless and easy import of data
- Provide use-cases to demonstrate capabilities and drive business planning
- Provide transferable and adaptable AI-related prototypes
- Ensure trust and quality by providing best practices, standards and benchmarking for assessment and feasibility
- Provide access to AI-related data services and data sets and regularly update
- Provide and regularly update information on AI-related financial support
- Increase exposure of DIHs
- Provide and regularly update an overview of existing capacities in the field of AI-related skills and training
- Provide AI-specific informative events such as workshops or web-café to promote reciprocal knowledge and stimulate collaboration and engagement with the platform

### 5.2. Next Steps

#### Demonstrate the effectiveness of collaborating on the AI on-demand platform

Collaboration among DIHs in Europe is a fundamental goal of the EC which is why solutions described in the section on AI on-demand platform offerings would enable DIHs and other organizations to leverage each other's capabilities and infrastructure, thus raising awareness, broadening the area of impact, and connecting regional and European ecosystems.

The EDIHs will have a focused support for European collaboration under DIGITAL in the form of the DTA. However, DIHs with a focus on AI, and others, will require external support, for example through the AI on-demand platform. Again, it is essential that the future AI on-demand platform collaborates with the DTA, but also with the Data Spaces Business Alliance (BDVA, IDSA, Gaia-X, FIWARE) and other platforms for Data and Cloud to avoid duplication and fragmentation and to facilitate interoperability. To ensure that DIHs focused on AI can benefit from the support the AI on-demand platform offers a primary goal will be to encourage DIHs to engage with the platform. To achieve this, the recommendation is as follows:

- Provide DIHs with an incentive to add content to the platform in an engagement strategy
  - For DIHs, there are two main types of operational incentives:

1. Companies and SMEs in the DIH ecosystem would benefit from a better offer as the offer of DIHs is enhanced by other assets coming from the AI on-demand platform
  2. The services of DIHs are accessible from other SMEs and companies beyond the DIH's ecosystem through the AI on-demand platform, which would also help build a larger community and increase visibility
- Demonstrate the effectiveness and benefits of engaging with the AI on-demand platform (platform offerings)
  - Provide an overview of existing capacities and networks that can be of value to DIHs
  - Provide a space with proactive tools on the platform to encourage active collaboration (this should include notifications and periodical activity feeds)
  - Ensure sustainability and availability

## Next Steps for Ensuring Strong Support

As discussed in Section 4, there are some DIHs that already possess strong capabilities which is why the capabilities of DIHs should be mapped to facilitate transferability and identify strengths and weaknesses. This would also facilitate the identification of collaboration opportunities across Europe. We recommend the following next steps for ensuring strong support for DIHs:

- Exploit existing capabilities and networks of DIHs to add value to the platform and increase transferability
- Encourage collaboration between the two types of DIHs through the platform in a dedicated space and networking resources
- Compare challenges and gaps faced by DIHs and determine how platform offerings can offer support