

# Blueprint for cross-border collaboration among DIHs

AI Digital Innovation Hubs Network



**This study was carried out for the European Commission - DG CNECT by**



*in partnership with*



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AI Digital Innovation Hubs Network

D10 – Final Study report

Smart 2017/0001

April, 2020

Presented by PwC EU Services EESV, in partnership with CARSA and Innovalia, to the European Commission, Directorate-General for Communications Networks, Content & Technology

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The project has received funding from the European Commission under service contract Study on "Digital Innovation Hubs Network" – SMART 2017/0001 – Number LC-00856684

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## The context

Digital Innovation Hubs (DIH) are expected to play a major role in the upcoming Multiannual Financial Framework 2021- 2027, fostering the widespread adoption of disruptive technologies - particularly Artificial Intelligence (AI), High Performance Computing (HPC) and Cybersecurity - by industry and public sector organisations. Cooperation is expected to increase the capacities, technologies and skills of each DIH and to reinforce their function, by creating synergies with other DIHs across the EU.

Aware of this potential, the European Commission and the European Parliament launched a preparatory action to create a European Network of 30 Digital Innovation Hubs with a focus on AI. The action - managed by PwC, in consortium with CARSA and Innovalia – is intended to develop a structured cooperation approach among DIHs, to create a European Network of Digital Innovation Hubs with focus on AI, and to provide policy recommendations for enhancing DIHs' collaboration.

The AI DIH Network project involved 30 DIHs from 20 different countries in a coaching and mentoring programme centred on cooperation, including face-to-face collaborative workshops, a peer-learning online programme and webinar training sessions, with remote and on-site support of individual tutors.

At the end of the programme, a Framework Cooperation Agreement has been signed by 25 DIHs at the Digitising European Industry Stakeholder Forum held in Madrid in November 2019.

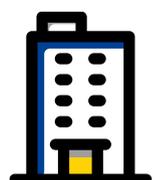
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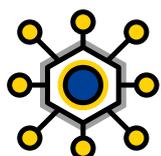
What it means to be an AI DIH



For DIHs: How to get ready for collaboration



How to evaluate DIH's readiness to cooperate



Building and maintaining your network



The cooperation scenarios



Policy recommendations to strengthen cooperation

## Introduction to the Study

Collaboration offers to Digital Innovation Hubs the possibility to upgrade their respective technological capacities, service offerings and in-house skills. Such benefits are even more relevant in the field of Artificial Intelligence, where cooperation is critical in fostering industrial and technological capacity across Europe and maximise the benefits of the efforts and investments sustained.

This blueprint outlines the key aspects a Digital Innovation Hub should consider when partnering up with another DIH and the schemes for a successful cooperation.

Three scenarios are outlined, enabling DIHs to establish collaborations in order to:

- Deliver a service in partnership with other DIHs and build synergies in terms of skills and assets;
- Develop a new service;
- Create new opportunities for their ecosystems by facilitating the identification of business, commercial and technical partners in other regions.

The scenarios are presented in terms of processes entailed in their implementation, players involved and their respective roles.

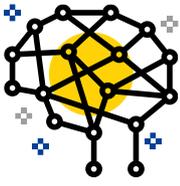
Each scenario is also analysed in terms of costs, risks and benefits for each actor to identify barriers that could prevent its involvement and to determine the potential solutions to introduce to overcome such obstacles. The identified solutions include the introduction of ad-hoc legal agreements but also financial incentives to assist the DIH sustaining higher costs connected to the collaboration.

The blueprint also reports the analyses performed on the characteristics that distinguish a DIH operating in the field of Artificial Intelligence.

These peculiarities are detailed in terms of:

- additional services offered by the DIH;
- skills and competences the DIHs should be able to leverage leverages internally or through their networks, and
- the operating model of the DIH.

The outcomes of the work performed led to the elaboration of recommendations addressed to the European Union (EU) institutions to promote collaboration among Digital Innovation Hubs and to ensure their role is consistent with EU priorities and programmes.



# What It Means to be an AI DIH

## The AI DIH and its service offerings

Digital Innovation Hubs focusing on Artificial Intelligence should maintain their role of one-stop-shops for their ecosystem, providing a wide range of services connected to different technological fields and applications. However, their service offerings should be characterised by some specific services connected to this science.

As an outcome of the AI DIH Network project, the services potentially offered by an AI DIH were clustered into the four functions that should be performed by a DIH according to the Digital Europe Programme (DEP), i.e. *Test before invest*, *Support to find investments*, *Innovation ecosystems and networking*, and *Skills and Training*.

It has to be noted that a DIH does not need to offer all the services identified to be considered an AI DIH. Indeed, the DIH offering has to be adapted and tailored to respond to the needs of its specific ecosystem and local stakeholders.



### Test before invest

- Strategic support to Research Development and Innovation (RDI)
- Contract research
- Technical support on scale up
- Testing and validation, including **Ethical AI Certification**
- Provision of infrastructure, including **data sharing services for training AI models**

### Support to find investments

- Strategic and business development, including **AI maturity assessment and AI service impact assessment**
- Support facilities /Incubator and accelerator support, including **data ecosystem and spaces**
- Funding lifecycle management support
- Legal and ethical AI support, including **Ethical AI Committee as a service and support**

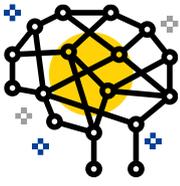
### Innovation ecosystem and networking

- Ecosystem scouting, engagement and management, including **relationships between DIHs of the network**
- Ecosystem coordination for projects

### Skills and training

- Training, including **executive courses on AI and innovation** and **lifelong training on AI-focused technical and soft skills**
- Talent and skills matchmaking
- Awareness raising, including the **organisation of awareness raising campaigns on AI**

In bold the activities and services that distinguish a DIH working on AI



# What It Means to be an AI DIH

## The competences and skills of an AI DIH

To deliver their services, Digital Innovation Hubs focusing on AI should be able to leverage on both **transversal competences** and **technical skills** related to AI. These competences do not need to be necessary internal. Conversely, it is essential that DIHs have the capability to take advantage of the competences **available in the network** by activating collaborations.

It should also be considered that specific training to transfer knowledge on AI, HPC and Cybersecurity to European DIHs is foreseen under the **Digital Transformation Accelerator**, financed by the DEP.

### ⇐ Transversal competences

In addition to specific knowledge, skills and competences necessary for the delivery of the DIH services, AI DIHs should also rely on a set of transversal skills throughout their activities.

In their day-to-day work, hubs need to show their ability to **manage projects**, to **communicate effectively** in different contexts, to **assess quality and risk issues**, as well as to demonstrate **sound reasoning** and **ethical behaviour**.

Providing advice to SMEs and/or Public Sector organisations in the field of AI requires a transversal knowledge of the **principles and functioning of Artificial Intelligence**.

### ⚙️ Technical skills related to AI

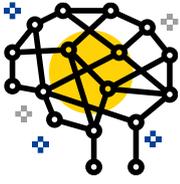
Working in the field of Artificial Intelligence requires technical skills to deliver a wide array of services, ranging from trainings to the development of algorithms. Although not all Digital Innovation Hubs working in the field of AI are expected to be highly specialised in this area, they are required to have, in-house or within their ecosystems, some basic AI knowledge and competences\*.

Among them, there is the knowledge of **AI principles and skills to utilise machine learning**, but also all the core knowledge that underlie the development of AI solutions and algorithms, such as **computer science**, **software design**, mathematics, statistics, etc.

Additionally, specific competences are necessary to ensure appropriate **governance**, **management**, **protection and storage of data** which are at the basis of the development and test of AI solutions.



\* Basic AI knowledge and competences were identified through to the ESCO framework, accessible at: <https://ec.europa.eu/esco/portal/skill>  
Blueprint for cross-border collaboration among DIHs

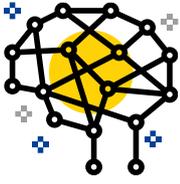


# What It Means to be an AI DIH

## The service offering of an AI DIH: test before invest

Service	Activity	Skills/knowledge (ESCO)*
<b>Strategic support to Research Development and Innovation (RDI)</b>	<b>Feasibility study, joint, pre-competitive R&amp;D</b>	Apply strategic thinking; Carry out strategic research; Collaborate with stakeholders; Identify needs and technological responses; Creatively use digital technologies; Assess the feasibility of implementing developments
<b>Contract research</b>	<b>Specific R&amp;D</b>	Manage research and development projects; Seek innovation in current practices; Analytical thinking; Develop new product;
	<b>Technology concept development/ Proof of Concept (PoC)</b>	Deep technical knowledge (e.g. data mining, principles of artificial intelligence, etc.); Assess the feasibility of implementing developments
<b>Technical support on scale up</b>	<b>Concept validation</b>	Develop new product; Design prototypes; Create prototypes;
	<b>Prototyping</b>	Perform market research; Calculate production costs
<b>Testing and validation</b>	<b>Product qualification</b>	Manage product testing; Oversee quality control; Quality assurance methodologies; Verify formal ICT specifications
	<b>Certification</b>	Perform quality audits; Quality assurance methodologies; Ensure compliance with legal requirements; Manage product testing; Verify formal ICT specifications
	<b>Ethical AI Certification</b>	Data protection; Data quality assessment; Quality assurance methodologies; Adhere to national and European professional code of ethics; Principles of artificial intelligence; Verify formal ICT specifications; Audit techniques
	<b>Product demonstration</b>	Demonstrate products' features; Implement marketing strategies; Demonstrate functionality of software products
<b>Provision of infrastructure</b>	<b>Support in technology infrastructure usage</b>	Use laboratory equipment; Perform laboratory investigations; Supervise laboratory operations; Apply safety procedures in laboratory
	<b>Data platform services</b>	Data administration; Implement data quality processes; Data protection; Information governance compliance; Data mining methods; Perform data cleansing; Manage data; Manage standards for data exchange

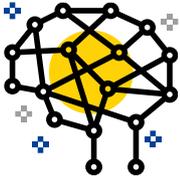
\* For each service included in the present and following tables, required skills/knowledge have been identified by referring to the ESCO framework, to ensure the use of a common European terminology. You can access the ESCO portal at the following link: <https://ec.europa.eu/esco/portal/skill>



# What It Means to be an AI DIH

## The service offering of an AI DIH: support to find investments

Service	Activity	Skills/knowledge (ESCO)
<i>Strategic and business development</i>	<b>Visioning and strategy development</b>	Strategic planning; Perform business analysis; Perform market research; Monitor technology trends
	<b>AI maturity assessment</b>	Assessment processes; Identify needs and technological response; Principles of artificial intelligence
	<b>AI service impact assessment</b>	Perform business analysis; Assessment processes; Perform market research
	<b>Business development</b>	Strategic planning; Develop business plans; Coaching clients Create business process models; Develop an organisational structure
<i>Support facilities /Incubator and accelerator support</i>	<b>Access to basic infrastructures and house offering</b>	Manage facilities services; Maintain relationship with customers; Implement marketing strategies; Data administration; Data protection
	<b>Access to infrastructure and technological platforms</b>	
	<b>Innovation spaces</b>	
<i>Funding lifecycle management support</i>	<b>Funding mapping and matching</b>	Advise on investment; Advise on government funding; Identify clients' needs;
	<b>Support to funding application and management</b>	Funding methods; Financial analysis; Apply for government funding;
	<b>Financial engineering</b>	Manage government-funded programmes; Create a financial plan; Funding methods
<i>Legal and ethical AI support</i>	<b>Fiscal and Legal Guidance</b>	Advise on tax policy; Provide legal advice; Intellectual property law; Disseminate information on tax legislation
	<b>Ethical AI Committee as a service and support</b>	Establish collaborative relations; Adhere to national and European professional code of ethics



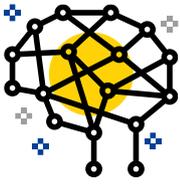
# What It Means to be an AI DIH

## The service offering of an AI DIH: innovation ecosystem and networking

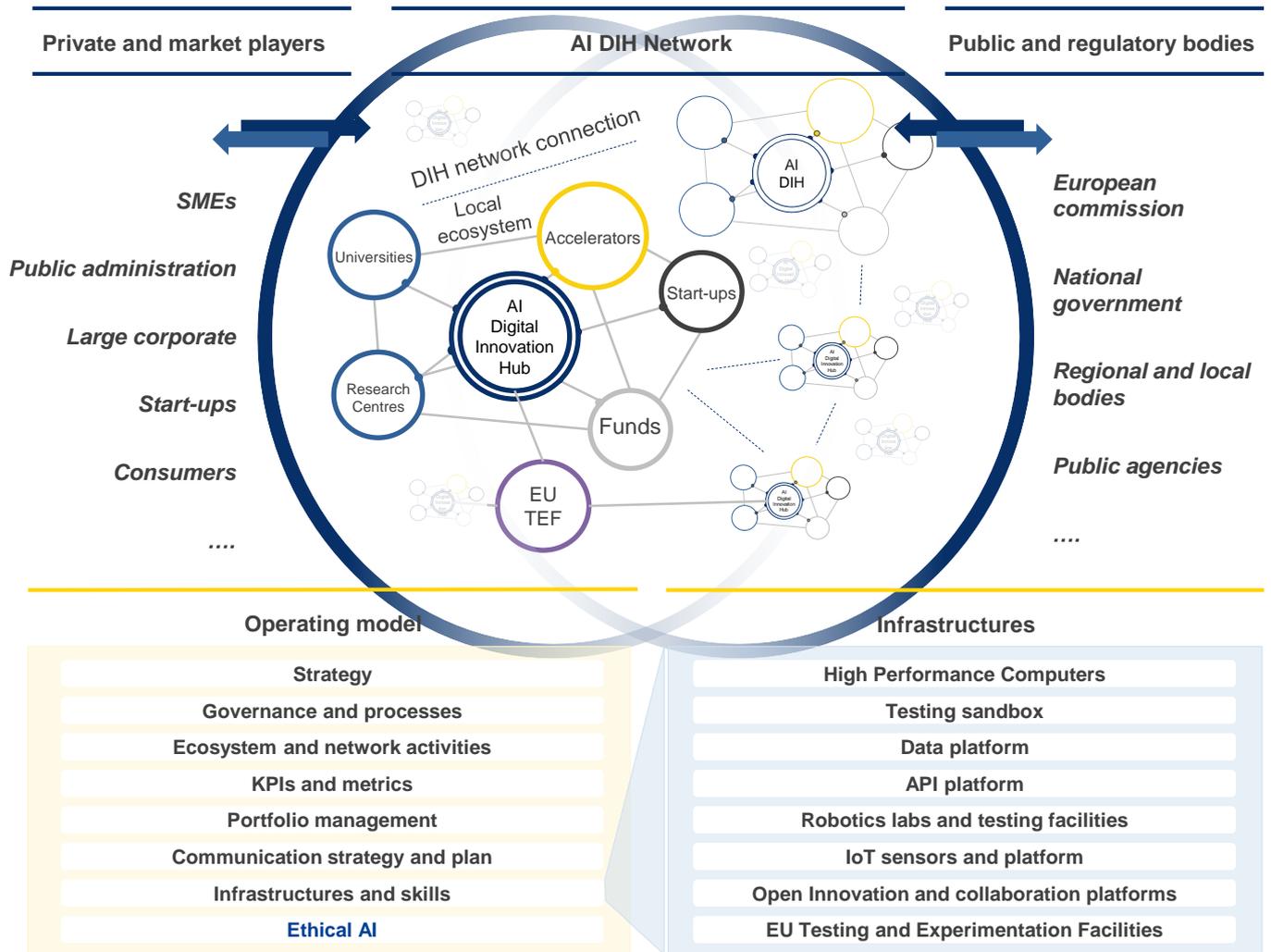
Service	Activity	Skills/knowledge (ESCO)
<i>Ecosystem scouting, engagement and management</i>	<b>Trend watching</b>	Monitor technology trends; Analyse economic trends; Present reports; Identify needs and technological responses; Perform market research; Creatively use digital technologies
	<b>Technology and third-party scouting</b>	
	<b>Ecosystem mapping</b>	
	<b>Ecosystem management</b>	Build business relationships; Develop membership strategies
	<b>Networking, events and initiatives</b>	Develop communications strategies; Use different communication channels; Coordinate events; Monitor technology trends; Perform market research
<i>Ecosystem coordination for projects</i>	<b>Identification of opportunities</b>	Monitor technology trends; Perform market research; Perform risk analysis; Identify clients' needs
	<b>Creating consortia</b>	Build business relationships; Create cooperation modalities
	<b>Development of proposals</b>	Project management principles; Present detailed design proposals; Interpret technical requirements; Manage ICT project

## The service offering of an AI DIH: skills and training

Service	Activity	Skills/knowledge (ESCO)
<i>Training</i>	<b>Executive courses</b>	Identify digital competence gaps; Use learning strategies; Strategic planning; Emergent technologies; Market analysis; Identify training needs; Training subject expertise; Perform business analysis; Learning management systems
	<b>Lectures</b>	
	<b>On-site company tailored training / Boot-camps</b>	
	<b>E-learning</b>	
<i>Talent and skills match making</i>	<b>Stage and talent acquisition</b>	Identify customer's needs; Carry out recruiting services; Develop communications strategies; Use different communication channels;
	<b>Secondment</b>	Build business relationships; Provide legal advice
<i>Awareness raising</i>	<b>Organisation of awareness raising campaigns</b>	Develop communications strategies; Use different communication channels; Monitor technology trends; Perform market research



# What It Means to be an AI DIH



## The operating model of an AI DIH

DIHs should equip themselves with an adequate operating model that ensures effective operations and seamless interactions with all stakeholders of the ecosystem - including potential customers, but also research centres, universities, start-ups, private investment funds, etc.

The creation of the operating model entails the definition of a **strategy** outlining the DIH mission and key intervention areas to both support a clear positioning within the local, national, and international context and facilitate activities prioritisation. Strategy definition should also include **funding mechanisms**.

A clear and flexible **governance** should be defined together with detailed **processes** for the most relevant activities allowing smooth and transparent operations.

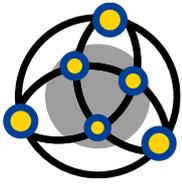
Specifically, the focus on AI-related topics imposes the introduction of the **ethical AI component** – even borrowed from external institutional players – within the governance structure of the DIH. Such component (e.g. a Committee, a permanent working group, etc.) could play different roles, depending on its outreach: from support to DIH internal decision to consultancy for the local ecosystem on ethical AI.

DIHs should also define a structured approach to map, engage and manage the interactions with the local, national and international **ecosystem and networking activities** (including those with other DIHs) to limit inefficiencies and foster market induce trust in the hubs.

In addition, DIHs should outline a consistent framework of KPIs and metrics to **monitor effectiveness and track results**, while ensuring constant alignment between overall strategy, market needs and trends, and institutions expectations.

All the afore-mentioned aspects should be complemented by the definition of an effective **communication strategy and plan**, to provide other players with a clear ground to set their expectations and to leverage on DIHs' actual capabilities and services.

Furthermore, DIHs should be able to grant access to both **physical and virtual infrastructures** that – by the activation of collaborations – could help the market to rapidly test and improve innovative solutions. Infrastructure supporting the development of AI solutions may include **HPCs, virtual environments, IoT sensors and platforms**, as well as **datasets** to enable the experimentation or the development of new business models.



# For DIHs: How to Get Ready for Collaboration

## Understanding your collaboration needs

**When defining the services to offer and the types of cooperation to undertake, a Digital Innovation Hub should always start from the analysis of its customers, defining their requirements, how it is responding to them and understanding how its offerings can be improved by the collaboration with other DIHs**

The mission of DIHs is to support the digital transformation of their ecosystem, including SMEs, midcaps, public organisations and all the other users there located. Therefore, to accomplish its objectives, a **DIH** should firstly consider which are the **needs of the ecosystem it should support**.

Carrying out a **customer journey mapping exercise** can help DIHs in this task.

The customer journey mapping visually illustrates the needs of an individual customer, the series of interactions and touchpoints that are necessary to fulfil these needs, and the resulting emotional states that a customer experiences throughout the process.

This methodology requires the DIH to adopt the point of view of its customer and understand what are their **expectations** and **motivation**, providing inputs for defining or refining the services offered.

A similar approach is recommended to ensure DIHs services are aligned with the context in which they operate and to improve the **DIHs customers' experience**.

The same logic should be applied when defining the cooperation initiatives a DIH should undertake.

**The primary objective of such activities should be to improve DIH capacity to meet the need of its customers and its ecosystems.**

This will then determine the characteristics of the partners that the DIH will seek and the types of collaboration initiatives it will undertake.

Therefore, to define DIH cooperation needs, we adapted the common journey mapping exercise to display:

- the stages of the customer experience and the customer feelings,
- the corresponding services provided by the DIH, and
- the possibilities for the DIHs to improve its performance thanks to collaboration.

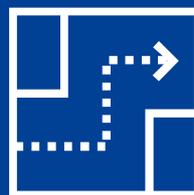
### The four steps of collaboration - oriented customer journey mapping



Analysis of the customer base to define its main features and needs



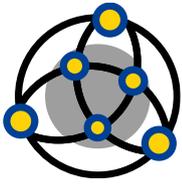
Creation of personas that can effectively represent your customer base



Definition of the customer journey map for all the customers



Customer journey mapping and identification of cooperation opportunities



# For DIHs: How to Get Ready for Collaboration

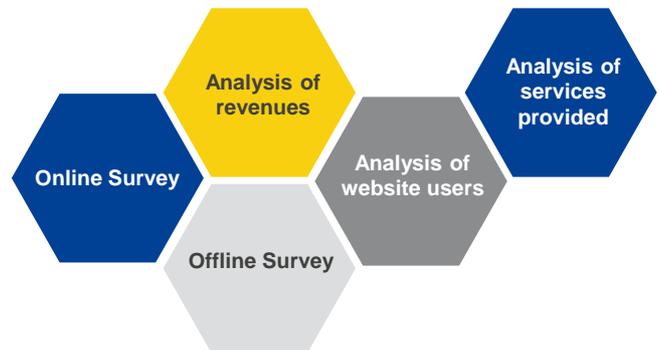
From customers to personas

## Step 1 – Analysis of the customer base

The first step of the analysis addresses the customer base of the DIH. The objective is to understand its characteristics and needs.

This information should set the stage for the information to be represented in the journey map and should serve as a basis for the creation of personas.

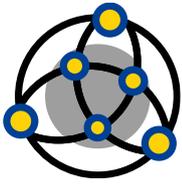
The analysis of the customer base entails the identification of customer segments presenting similarities in terms of behaviour, expectations and needs.



Segmentation can be performed based on **qualitative analysis**. For example, online or offline questionnaires can be used to understand the reasons why customers decided to contact the DIHs, how they learned about the existence of the DIH, etc.

The information gathered should be normalized and then analysed to identify patterns and to define the relevant segments. Segmentation should be also backed by **quantitative data**, e.g. average revenues per year, number of services provided per year, etc.





# For DIHs: How to Get Ready for Collaboration

From customers to personas

## Step 2 – Creation of personas

According to the official definition established in 2002, personas are:

*Research-based archetypal (modelled) representations of who buyers are, what they are trying to accomplish, what goals drive their behaviour, how they think, how they buy, and why they make buying decisions*

Therefore, personas are a detailed description of the real customer segments identified in the previous analysis. Personas are not created to represent the whole customer base of the DIHs, but to exemplify target users' objectives and supporting the understanding of their needs.

Transforming theoretical segment into fictional personas help DIH developing empathy for target customers and putting themselves into the users' shoes.

Personas can be either basic or detailed according to the DIH preference.

What should not be missed is information about the drivers of the behaviour of the different types of users.

In case of the DIHs, the goals driving the different types of customers analysed (e.g. entrepreneurs, owners of SMEs, researchers, representatives of local administrations, etc.) may include:

- Process innovation;
- Product/ service innovation;
- Supporting in scaling-up a new technological solution;
- ...

An example of DIH persona, with its main characteristics, is reported in the fiche below.

## SME seeking for process innovation solutions

Meet TomatoX

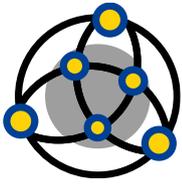


<b>Reference market</b>	Regional
<b>Number of employees</b>	120
<b>Year of establishment</b>	2001
<b>Sector</b>	Food

"I have been working at TomatoX as CFO for 10 years now. Over the last year, I noticed an increase in the cost of maintenance of our production machines. If we did not find a solution to keep these costs under control, we could face a financial risks in a few months"



<b>What are TomatoX objectives?</b>	Achieve business goals (such as cost reduction or revenues increase) through the optimization of its processes
<b>What is TomatoX likely to need?</b>	<ul style="list-style-type: none"> <li>• Innovative solutions to achieve its goals</li> <li>• Financial resources to implement the solutions</li> <li>• Competences and skills to take full advantage of the solutions</li> </ul>
<b>What is the digital maturity level of TomatoX?</b>	<ul style="list-style-type: none"> <li>• Low digital maturity level, characterized by an opportunistic adoption of innovative solutions</li> <li>• Low propensity to open innovation</li> <li>• Incremental solutions preferred to disruptive technologies</li> </ul>



# For DIHs: How to Get Ready for Collaboration

## A map of customer experience

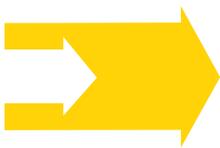
### Step 3 – Creation of the customer journey map

Journey maps resemble flow diagrams and focus on the series of events that make up a customer's experience.

In the case of DIHs, customer journey maps should be visual representations of the process the customer goes through to take advantage of a service offered by the DIH, from the first contact to the implementation phase.



### The journey map should entail two following dimensions:



#### X axis

This axis is always present on any journey map and is a high-level description of the customer experience from start to finish. Despite each customer journey is different from another, evidence from the AI DIH Network project suggests that common key phases can be identified.

When defining the journey map of a DIH customer, the first stage along the X axis is the contact phase, when the customer gets to know the DIH and the support it can provide.

In this stage, the DIH is focused on raising awareness and attracting potential clients. The services connected are mainly communication and dissemination activities.

The second phase of the customer journey concerns the identification and definition of the perimeter of the customer's needs. The DIH supports the client in identifying and understanding the issues it is facing and designing preliminary approaches to their solution.

Use case definition represents the third phase of the typical customer journey. In this phase, the DIH presents to the client possible solutions identified to fulfil its need.

Finally, during the implementation phase, the services offered by the DIH vary depending the needs it must address. For instance, the implementation phase can entail different services such as testing, scale-up, brokerage, and delivery of an awareness campaign conceived based on a specific need of the client or of a community.

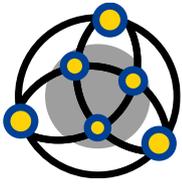


#### Y axis

A second axis can be added to include a customer's emotional experiences. In the view of identifying potential for cooperation, it has been adapted so to include, for each phase; the service offered by the DIH and the opportunities for cross-border collaboration among DIHs.

More specifically, the following elements have been included:

- **Activities:** the actions undertaken by the customer under a specific phase of the journey, allowing for the identification of the mechanisms through which the customer interacts with the DIH;
- **Motivations:** the rationale behind the actions undertaken by the customer;
- **Love points/ pain points:** conditions that can increase client's satisfaction or, in case of pain points, can end the client journey;
- **Service offered by the DIH:** the service offered by the hub, under each specific phase of the journey, to respond to the needs of its customer;
- **Collaboration opportunity:** potential opportunities for cross-border collaboration that allow the DIH to satisfy the needs of its customer;
- **Application of collaboration:** concrete areas of application of the collaboration to improve the service offered;
- **Expected outcomes:** results arose from the implementation of cross-collaboration activities.



# For DIHs: How to Get Ready for Collaboration

Collaboration to respond to customers' needs

## Step 4 – Customer journey mapping

The last step is represented by the mapping of the customer journey for each of the personas identified, by running through the defined phases of the customer journey.

The exercise allows the DIH to identify all key phases of the customer interaction and the activities it should undertake to deliver a satisfactory service to the client. The ultimate goal is to identify in which stages cross-border collaboration is needed to enhance (or enable) the service offered.

To ensure the effectiveness of the customer journey mapping, the DIH has to proceed phase-by-phase to the end, starting from the moment the customer get in touch with it to the completion of the service.

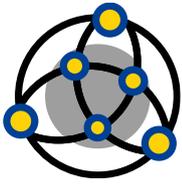
The objective is to consider the perspective of the customer by mapping what she would do in each stage of service delivery and why, what would make her happy with the service received and what would let her disappointed.

Once determined the customer needs, motivations, love points and pain points, the focus should be moved to the DIH.

Firstly, the activities and services provided by the DIH in each phase of the customer journey should be outlined. Such services should be then analyzed to determine if and how cooperation can help the DIH:

- To improve its service and to meet the customers' love points and/or
- to acquire the capacity to deliver the service.

	Contact	Scoping	Use case definition	PoC definition and validation	Scale up
Activity	Participation in an event organized by the DIH Reception of an email	Investigation of similar cases and definition of the problem	Identification of possible applicable solutions	Testing of the identified solution on the SMEs processes	Finding of the resources to scale up and implement the solution
Motivation	Willingness to explore opportunities opened by innovation	Assessment and focus on the need	Find the most adequate solution to the need identified	Verify the feasibility of the solution and identify the short-term benefits	Observe the benefits on a large scale
Love points	Event useful for networking and for improving knowledge on the sector; Solution-based event	Learning about practical experiences of similar SMEs	Suggestion of innovative and up-to-date affordable solutions	Successful validation	Smooth scale-up of the solution
Pain points	High costs in terms of time (e.g. excessive number of events)	References with scarce relevance/ gap of competences	Lack of competences to implement the solutions Proposal of a solution hardly applicable	Data issues (data not available, not adequate fear for misuse); Delays in the implementation; Scalability issues	Lack of resources to scale up; Difficulty of integrate the solution with the mechanisms in place
DIH service	Communication/ dissemination activities; Participation in sectorial fairs; Visit to the SMEs; Organization of networking events	Showing references, case studies and best practices (from the industry); consulting services; one-to-one visit; Solution scouting	Analysis of process & value chain; Digital Assessment, Solution evaluation; Definition of attainable KPIs	Provision of testbed facilities; Provision of experts PMO/ coordination of projects; Finding financing sources; Matchmaking	Finding financing sources; Talent scouting; Technical support on scale up
Collaboration opportunity	Integration of knowledge and competences/ Economies of scale/ Systematization of communication strategies	Fill in sectoral gaps	Provide a wide range of possible solutions	Capacity to deliver the service	Widen the financing opportunities for the project (private channels, investors); Find resources for the transformation
Application of collaboration	Sharing of experts to take part in communication events; Joint participation in fairs	Exchange of knowledge repository; Feedback on available solutions; Sharing of experts to tutor the SME	Connecting ecosystems; Sharing a network of sectoral experts	Sharing of domain-specific platforms/ experts; Facilitate contact with other companies in the value chain	Knowledge sharing on funding opportunities Sharing of experts for supporting scale-up
Expected outcomes	Greater number of SMEs engaged in the network	Better focus of the client's need via a wider network	Find more adequate solutions for the project	Service provision	Offer more adequate support; Maximize the possibility of success of the project



# For DIHs: How to Get Ready for Collaboration

## The customer journey of a PA

An example of the customer journey of a PA is presented below. This is only one of the many ways a DIHs could support a public sector organisations – directly, as in this case - or indirectly, e.g. supporting SMEs that operate in the public sector.

### Municipality of Elsewhere: example of a customer journey of a local PA

The Municipality of Elsewhere is a **PA body** seeking for an **innovative solution** to solve the daily problem of traffic jams in the territory in which it operates. More specifically, the Municipality is looking for efficient solutions for **traffic vision and monitoring** already available on the market, as the ones successfully implemented by other cities facing the same issue. The ultimate goal is **to improve the provision of services to citizens** by following experience of other ‘front-runners’.

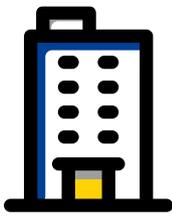
Overall, the journey of the Municipality of Elsewhere starts when **contacted by the DIH**. For example, the PA receives an invitation to participate in an event/workshop organised by the hub.

The **scoping** represents the second phase of the journey. The PA meets the DIH to present its specific need and define together the scope of the problem and what kind of support the hub can provide.

The identification of the issue to be addresses leads to the third phase of customer journey, represented by the **use case definition**. The key objective for the PA is to identify potential solutions available in the market to be applied in its territory.

Once the use case is defined, the last phase of the journey of the Municipality of Elsewhere is represented by the **implementation and scale-up of the identified solution**.

	Contact	Scoping	Use case definition	Implementation and scale up – Eventual piloting
Activity	PA contacted by the hub: event/workshop invitation Sponsored by other PA in the board of the hub	Investigation of similar cases and definition of the problem	Identification of possible applicable solutions	Support to the definition of requirements for the procurement of the solution Testing of the identified solution on the PA processes/ facilities
Motivation	Willingness to explore opportunities offered by innovative technologies	Assessment and focus on the need	Find the most adequate solution to the need identified	Identify the requirements necessary for the procurement of the solution Verify the feasibility of the solution and identify the short-term benefits
Love points	The event covers the areas of interest of the PA	Wide repository of relevant cases	Identification of an innovative, easy-to-implement solution responding to Municipality needs	DIH with experience in the field of procurement Access to advanced facilities, benefits immediately identified Understanding of PA internal processes/ hierarchies
Pain points	Potential limits for PA to contact the hubs	References with scarce relevance/ gap of competences/ Scarce knowledge of the specificities of the process	Lack of competences to implement the solution Proposal of an inadequate solution	No experience in drafting procurement proposals; Issues in data sharing/ Delays in the implementation (causing higher costs); Scalability issues/ Inadequate infrastructure
DIH service	Communication/ dissemination activities, such as awareness campaigns and open days	Showing references and case studies Solution scouting	Analysis of process Solution evaluation Definition of attainable KPIs	Support to the development of the proposal (in particular technical section) Provision of specialised facilities
Collaboration opportunity	Integration of knowledge and competences/ Economies of scale/ Systematisation of communication strategies	Fill in sectoral gaps	Provide a wide range of possible solutions	Fill-in competence gaps Improve service delivery capacity
Application of collaboration	Common communication activities Sharing of experts to take part in communication events	Exchange of knowledge repository/ knowledge sharing	Sharing of innovation ecosystems	Sharing of technical knowledge on innovative solutions Sharing of knowledge and experience on innovation procurement Facility sharing
Expected outcomes	Greater number of PAs engaged in the network	Better focus of the client's need via a wider network	Find more adequate solutions for the project	Submission of the procurement proposal for the identified solution Enhanced service provision



# How to evaluate a DIH's readiness to collaborate

**Before undertaking a collaboration, a DIH should be aware of the resources it can leverage and of the barriers and limits it may need to overcome**

Collaboration requires an investment from the DIH in terms of time and resources. For instance, it should establish and maintain relationships with potential partners, by taking part into networking events, information days, etc. It should dedicate people to manage and carry out activities involved in the collaboration, including both project coordination and technical and research activities. Administrative and governance aspects connected to collaboration should be considered as well.

It may be the case that the DIH legal status and financing model limits the possibility of collaborating with DIHs from other countries, to receive payments for its service, etc.

To verify that the DIH has the characteristics and the resources needed to start engaging into a collaboration, we have prepared a questionnaire working as a self-assessment to understand the changes required before starting a cross-border collaboration.

Potential partners		
<b>Are you aware of the competencies and skills your partner should have?</b>	I have not defined drivers for identifying my partners	I have analysed my cooperation needs and identified complementing skills I am looking for
<b>Are you able to contact specific potential partners?</b>	I have not established relationships with other DIHs	I am in regular contact with other DIHs and I know their reference person
<b>Are you registered on the JRC catalogue of DIH?</b>	I am not aware of this catalogue	I have included updated and specific information on my DIH on the JRC catalogue
<b>Is it possible to find clear information on your DIH and the service it offers online?</b>	I have a website in my local language	I have a website with complete English sections, including example of real use cases

### How to follow up

If the majority of these questions show negative answers, the DIH might need to focus on enhancing its networking and outreaching activities, to improve its capacity to communicate effectively with its ecosystem.

Legal status		
<b>Does your legal status enable you to offer services to DIHs/clients in other regions?</b>	No and no partner in the DIH can represent it legally	I have experience in working with partners and clients from other regions
<b>Can you DIH receive payments for the service it provide?</b>	No and this creates issues in cooperating with DIHs with different legal status	I have experience in sharing fees with other partners

### How to follow up

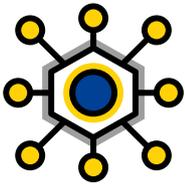
If the legal status of the DIH hinders collaboration, the Hub could either review its statute or consider to found/rely on a parallel organisation.

Internal structure and resources		
<b>Do you have standard procedures for establishing collaborations?</b>	No, I start from scratch every time	I have lean, standard procedures that can be adapted for special cases
<b>Have you experience in negotiating and signing collaboration agreements?</b>	No we have never undertaken structured collaborations	Yes and I am aware of the need of including specific clauses depending on the agreement
<b>Do you have sufficient staff and resources to engage into networking and information events?</b>	No, we cannot attend similar events	There is at least one person taking care of relationships with our partners
<b>Do you have resources to respond to collaboration request for your partners?</b>	No, our team is already overstaffed with internal requests	Collaboration projects are part of our usual activities and tasks

### How to follow up

Poor results in the above questions indicate that the Hub might need to review its organisational structure and business model. This could include:

- establish standard, agile procedures,
- re-allocate responsibilities or resources.



# Building and maintaining your network

## Existing European AI-related initiatives and networks of DIHs

At European level, Digital Innovation Hubs are involved in a number of project and initiatives, many of which focussing on AI-related topics. The table below reports a non-exhaustive list of ongoing European initiatives, projects, platforms and networks involving DIHs, which may represent a good starting point for DIHs interested in identifying potential partners and explore AI-related collaborations.

## The Digital Innovation Hubs Catalogue

The Digital Innovation Hubs Catalogue is the official European repository of existing DIHs across Europe. The catalogue includes comprehensive information on each DIH, including technical specialisation, services provided and examples of use cases. The platforms allows to apply different search filters and to visualise results both as a list and as a map.

<https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>



Project	Description	Website
	The AI DIH Network is a preparatory action of the EC bringing together 30 DIHs from across Europe to explore opportunities and models for cross-border collaboration in the field of AI.	<a href="https://ai-dih-network.eu/">https://ai-dih-network.eu/</a>
	Established with the support of the EC, the project aims to build a European Artificial Intelligence On-Demand Platform and Ecosystem	<a href="https://www.ai4eu.eu/">https://www.ai4eu.eu/</a>
	European project supporting collaboration and fostering connection between existing networks of Digital Innovation Hubs	<a href="https://dihnet.eu/">https://dihnet.eu/</a>
	MIDIH supports the digital transformation of manufacturing SMEs and is currently composed by 3 Pan European DIHs, 2 DIHs, 9 Competence Centre and 2 Teaching Factories	<a href="https://midih.eu/project.php">https://midih.eu/project.php</a>
	I4MS is a European Commission project that supports the digital transformation of manufacturing SMEs through a network of Digital Innovation Hubs	<a href="https://i4ms.eu/">https://i4ms.eu/</a>
	Rodin is an H2020 project coordinating the activities of different DIHs European Networks working in the field of robotics. Networks coordinated by Rodin include: DIH-HERO, DIH2, TRINITY, RIMA, AgROBOfood	<a href="https://rodin-robotics.eu/">https://rodin-robotics.eu/</a>
	The European AI Alliance is a forum established by the EC to collect feedback on AI policy issues and to provide inputs for the High Level Expert Group on Artificial Intelligence (AI HLEG)	<a href="https://ec.europa.eu/futurium/en/eu-ai-alliance">https://ec.europa.eu/futurium/en/eu-ai-alliance</a>
	CLAIRE is a research network bringing together experts and research institutions working on Artificial Intelligence across Europe	<a href="https://claire-ai.org/">https://claire-ai.org/</a>
	Data Pitch is a EU-funded open innovation programme dedicated to open data. It works with start-ups and SMEs to connect them with the right corporate and public-sector organisations that could provide them with the needed data	<a href="https://datapitch.eu">https://datapitch.eu</a>
	European project led by four national RTOs that support European companies in the uptake and development of solutions in the field of robotics	<a href="https://robo-tt-net.eu">https://robo-tt-net.eu</a>
	The Big Data Value Association (BDVA) is an industry-driven international not-for-profit organisation whose mission is to develop an Innovation Ecosystem that will enable the data and AI-driven digital transformation in Europe	<a href="http://www.bdva.eu/about">http://www.bdva.eu/about</a>
	Smart Anything Everywhere (SAE) is a H2020 funded project offering funding and support to SMEs in their digital transformation and to establish fully functional ecosystems of DIHs that can also provide services beyond technical advice (e.g. business consulting and training)	<a href="https://smartanythingeverywhere.eu">https://smartanythingeverywhere.eu</a>



# The Cooperation Scenarios

## How Cooperation Can Take Place

Collaborating with the DIHs involved in the AI DIH Network projects, we have defined three scenarios representing different mechanisms and processes that DIHs can use to cooperate among each other, depending on the objectives they want to achieve.

Each scenario is hereby presented in terms of:

- objectives;
- processes and role of the actors involved;
- horizontal tools that can support the implementation of the scenario.

## Development of a new service

This scenario is used in case a DIH decides to enlarge its offerings by developing a new service to respond to the ecosystem needs and wishes to leverage skills and capabilities available within the network to design the service together.

Considering the AI field, examples of new services - that have been discussed by the AI DIH Network members - may encompass the development of a comprehensive awareness campaign focussed on AI for a determined category of users (e.g. local public administrations) or the design of a common AI Maturity Assessment tool.

### How it works

1. DIH1 looks for partners with complementary or similar competencies willing to take part in the development of the service. This phase can be implemented starting from a platform mapping DIHs' competencies or simply contacting DIHs located in the same/different ecosystem.
2. DIH1 discusses together with interested DIHs (DIH2 and DIH3) the potential cooperation opportunity and the features of the services that should be developed.
3. The three DIHs co-create and sign a cooperation agreement, reflecting the strategy and covering related legal and financial issues (e.g. IPR of the service and contents developed).
4. The three DIHs implement the strategy and activities agreed. Once the service is developed, each DIH delivers it to its ecosystem.

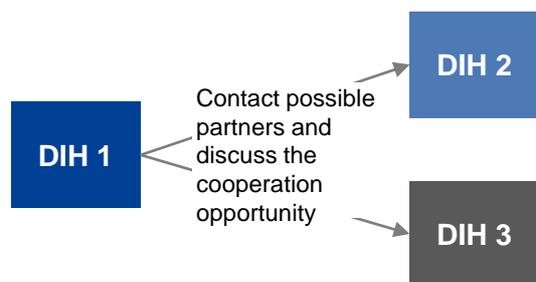
### Horizontal tools supporting the implementation of the scenario

1. Regular face-to-face meetings/working groups to facilitate DIH awareness of each other activities
2. Platform/ tool for knowledge sharing (e.g. share information on available data sources, recommended providers, use cases, lessons learnt, etc.)

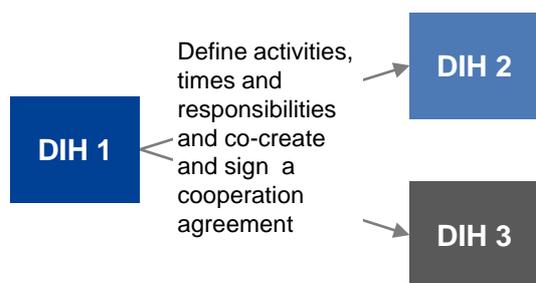
### 1 Look for a partner in the Network



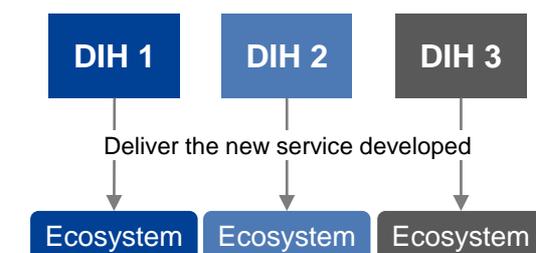
### 2



### 3



### 4





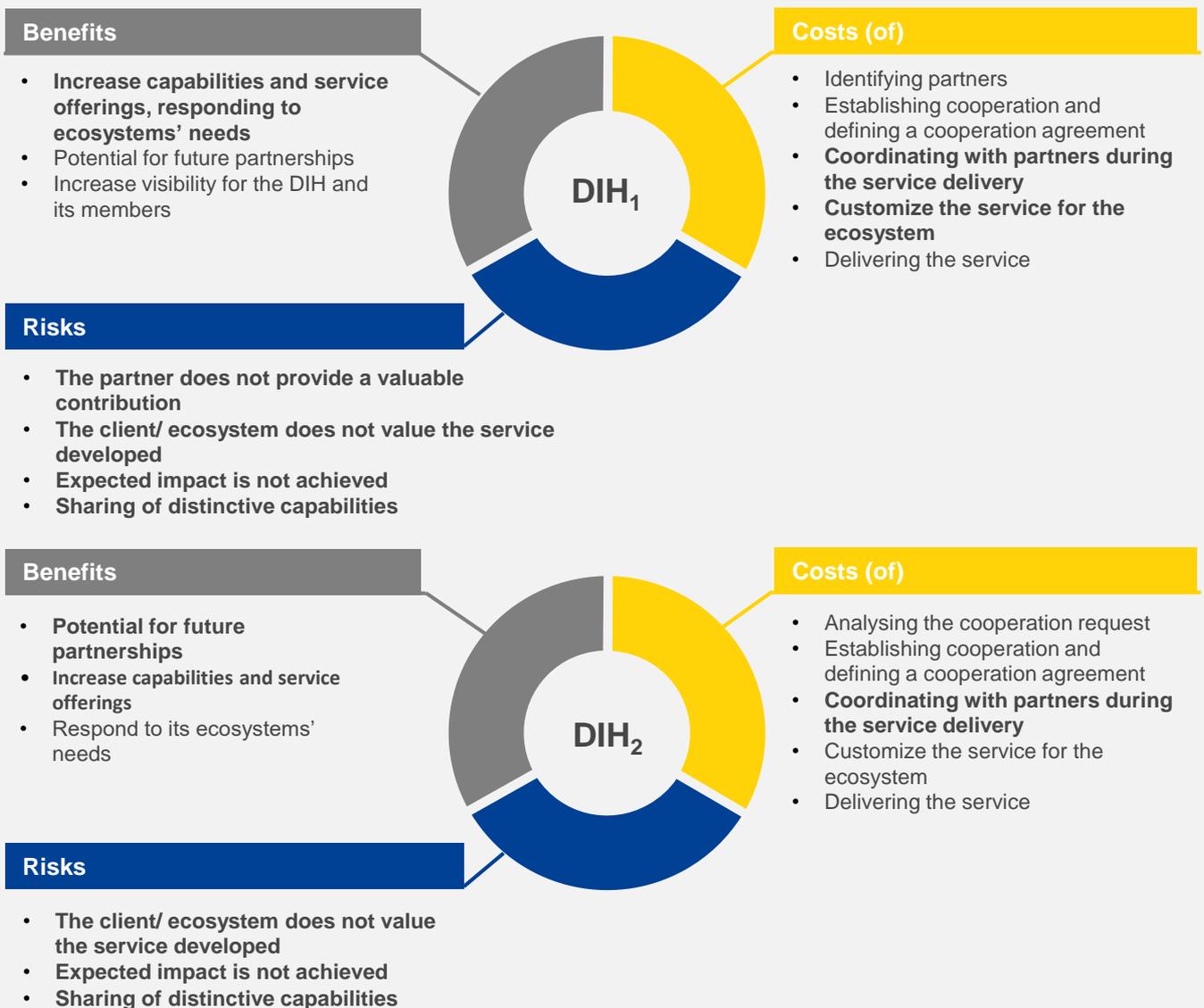
# The Cooperation Scenarios

## Development of a new service: costs, risks and benefits

The analysis of costs, benefits and risks of the players involved in the cooperation scenario highlighted that its applicability can be enhanced by:

- A deeper knowledge of the EU markets and ecosystems, enabling DIHs to identify common needs and challenges more easily. Ideally, targeted studies and analysis should be developed at EU level to support this knowledge. Understanding the challenges and needs shared by different ecosystems would encourage DIHs there located to get in contact and develop common services to tackle them.
- The introduction of standard templates for governing the development of new services. This will protect hubs from the risk that the partner is not committed and protect the IPR of the solutions developed. As an example, the parts can sign an agreement that shall expressly set the rules concerning the liabilities of each hub involved, before the client and the other hubs that take part in the development of the new service. On the other hand, IP issues shall be addressed in advance on the basis of the relationship between the hubs involved. For example, the DIHs involved might joint-hold the solution created or, as an example, DIH1 might license the right use of the solution created to the other hubs involved.

### Costs, risks and benefits of involved DIHs



*Most relevant costs, benefits and risks in bold*



# The Cooperation Scenarios

## Partnership to deliver service jointly

This scenario enables DIHs to deliver services in cooperation with other partners with complementary competences. This form of cooperation can be activated if DIH1 assesses the client's problem and realises that additional competences are needed to deliver the service requested.

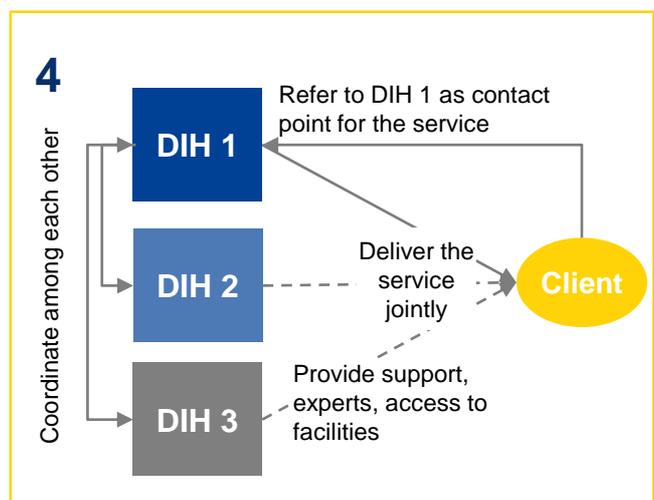
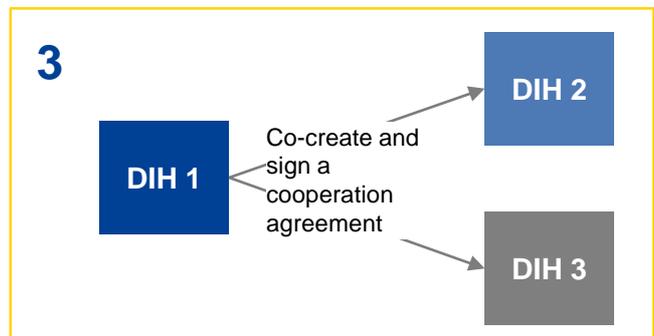
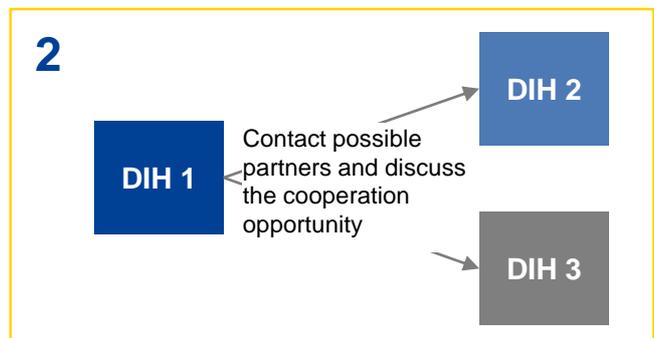
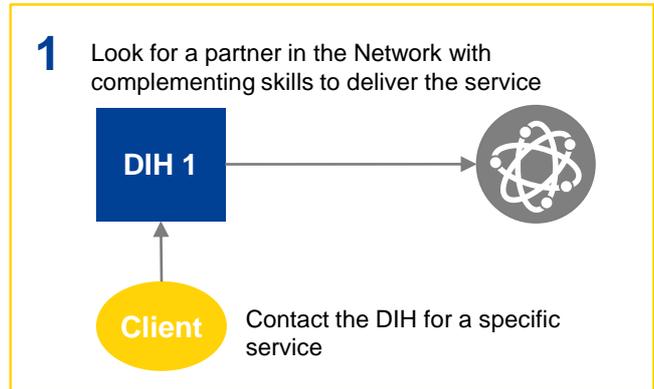
Specifically, to provide joint services the DIHs may need to exchange experts/expertise and/or share existing facilities. These specific cases do not entail significant differences in the process outlined. Yet, these aspects need to be addressed in the cooperation agreement among the DIHs. Also, it has to be noted that the mobilisation of experts should be considered for a limited amount of time to avoid possible obstacles related to the presence of different labour laws in different EU Countries.

### How it works

1. The Client asks for support to its local DIH (DIH1). After analysing its request, DIH1 realises it will not be able to deliver the service by its own and looks for the other hubs belonging to the Network that owns the necessary competences.
2. DIH1 identifies possible partners and contacts them to partner up. The contacted DIH(s) (i.e. DIH2 and DIH3) analyse the proposal and decide whether to discuss the opportunity with DIH1. If they are interested in the opportunity, they will also explore a potential cooperation.
3. The involved DIHs co-create and sign a cooperation agreement, specifying roles and responsibilities in the delivery of the joint service and KPIs of the cooperation.
4. The involved DIHs jointly deliver their bundled services to SMEs. DIH1 acts as the contact point for the client and coordinator of the activities.

### Horizontal tools supporting the implementation of the scenario

1. Platform information on services, competencies, skills and AI testing facilities of the potential partners
2. Regular face-to-face meetings/working groups to facilitate DIH awareness of each other activities



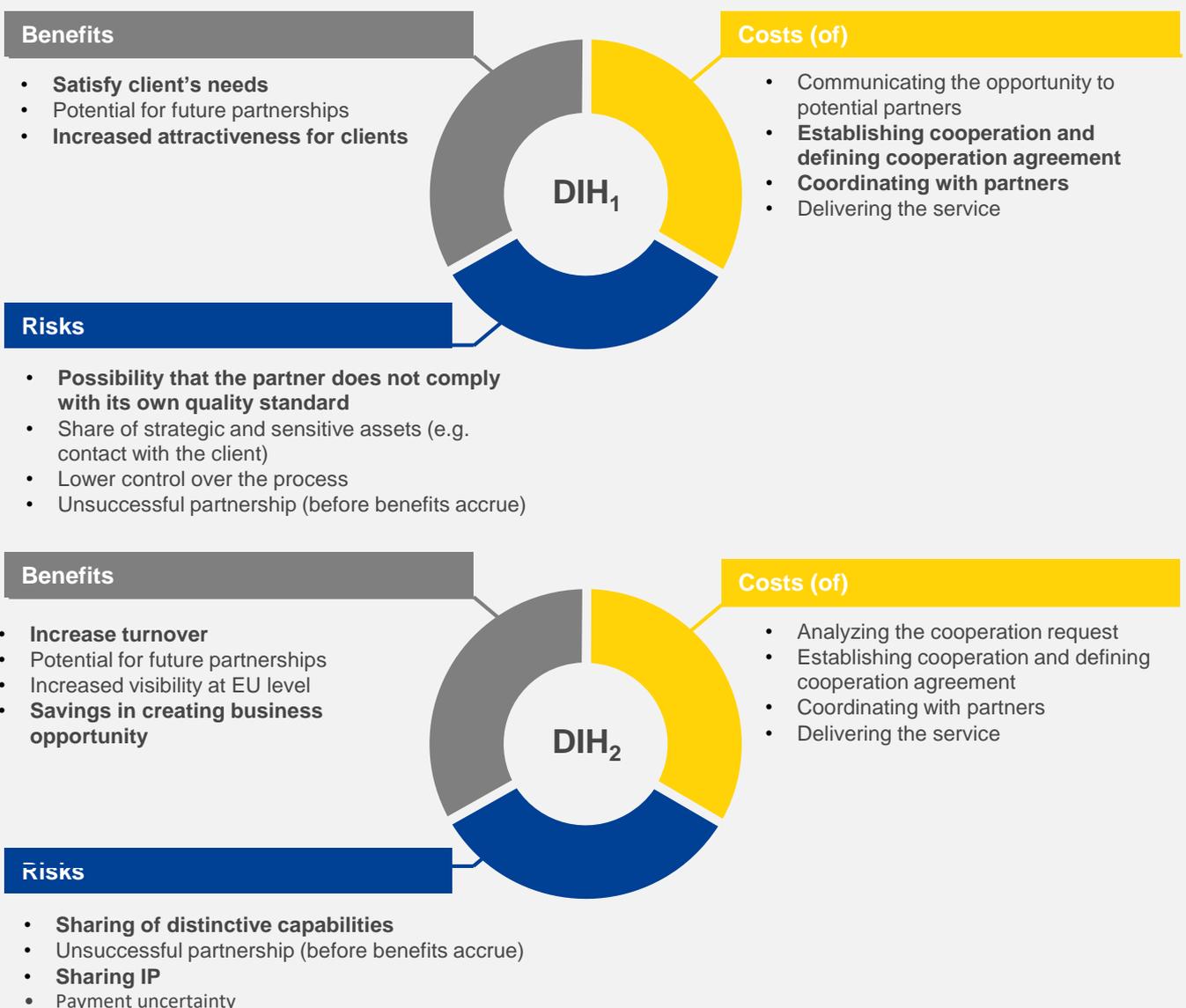


# The Cooperation Scenarios

## Partnership to deliver service jointly: costs, risks and benefits

Based on the analysis of the costs, benefits and risks of the scenario (performed in cooperation with DIH representatives), it resulted that this scheme may be enhanced by:

- Regulating liabilities of the parties, to mitigate the reputational risk of DIH1 by providing that DIH1 is responsible before its client, while DIH2 is liable before DIH1 as to the service offered to DIH1.
- Introducing non-compete agreement that can, if deemed necessary, protect the exclusivity of the relationship between DIH1 and its client. Similar agreements shall be limited as to duration and shall expressly set material and territorial scope.
- Using template for IP protection help to mitigate the risk for DIH2 to share its capabilities, skills and IP while delivering the service. Furthermore, a specific clause within the service agreement between DIH1 and DIH2 shall be provided that expressly addresses the issues relevant to confidentiality of information.
- Financial support to incentivise DIH1 to sustain the additional cost connected to the cooperation (i.e. costs sustain to start and manage the cooperation process). Indeed, the revenues/ payment received for the service may not be sufficient to cover the costs of the external collaboration and the DIH does not benefit of the savings in the creation of the business opportunity that apply to DIH2 cost and start the cooperation initiative may be necessary.



*Most relevant costs, benefits and risks in bold*



# The Cooperation Scenarios

## Matchmaking

This scenario is used when the DIH needs to support a user in identifying potential partners in another ecosystem. The matchmaking request may regard technological, business or financial partners (e.g. identification of solution providers, clients, investors or financiers, industrial partners, etc.).

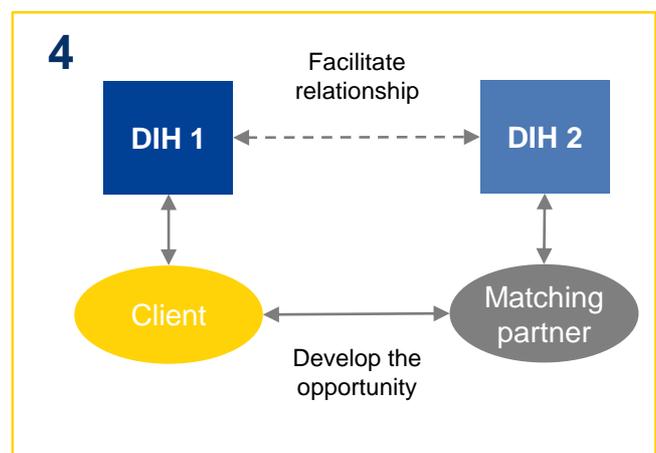
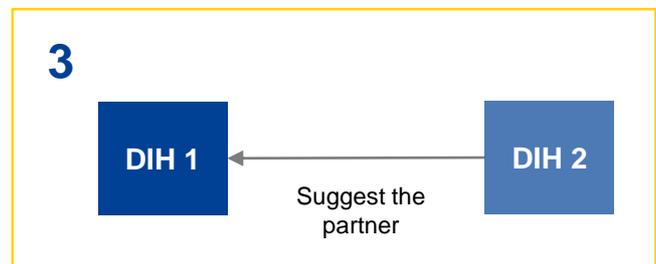
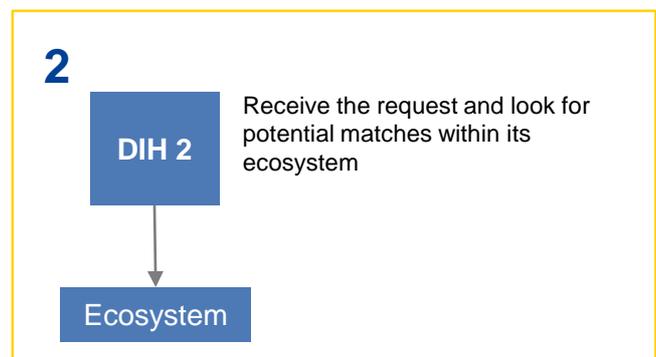
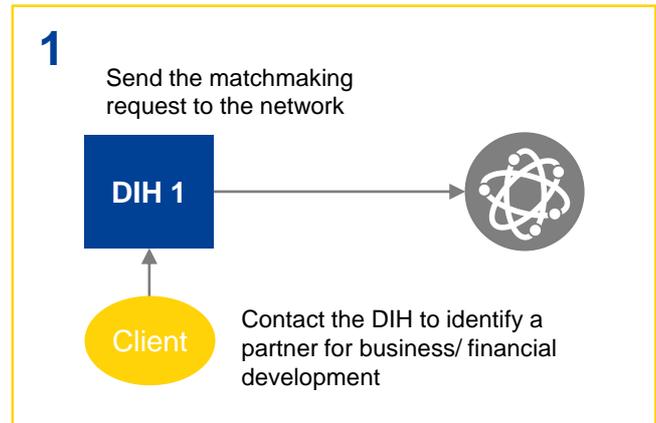
By involving other hubs in the search, the DIH will have the possibility to consider more possible partners for its clients and, together with the DIH Network, will support the creation of business opportunities across different ecosystems.

### How it works

1. The client contacts the local DIH (DIH1) to identify a partner for its AI project, product or investment. The DIH1 decides to extend the request to the Network either because the kind of partner sought is not available in the local ecosystem or to simply widen the range of possible partners (in agreement with the client). DIH1 launches a “partner request” to the Network.
2. DIH2 receives the DIH1 request and searches within its ecosystem for a potential partner to be put in contact with the client of DIH1. Partner searched may include industrial or financial partner, data providers, solution developers, buyers, etc. accordingly to the need expressed by the client.
3. Once the potential matching partner is identified, DIH2 suggests it to the DIH1.
4. DIH1 and DIH2 cooperate and act as facilitators between the initial client and the matching partner by, for instance, aligning the requirements of the two actors, organising an initial meeting to find an agreement on cooperation and providing support to overcome linguistic and cultural barriers.

### Horizontal tools supporting the implementation of the scenario

1. Digital platform/mechanisms to facilitate matchmaking activities (i.e. share information about matchmaking opportunities and potential partners)
2. Regular face-to-face meetings/working groups to reinforce DIHs’ reciprocal knowledge



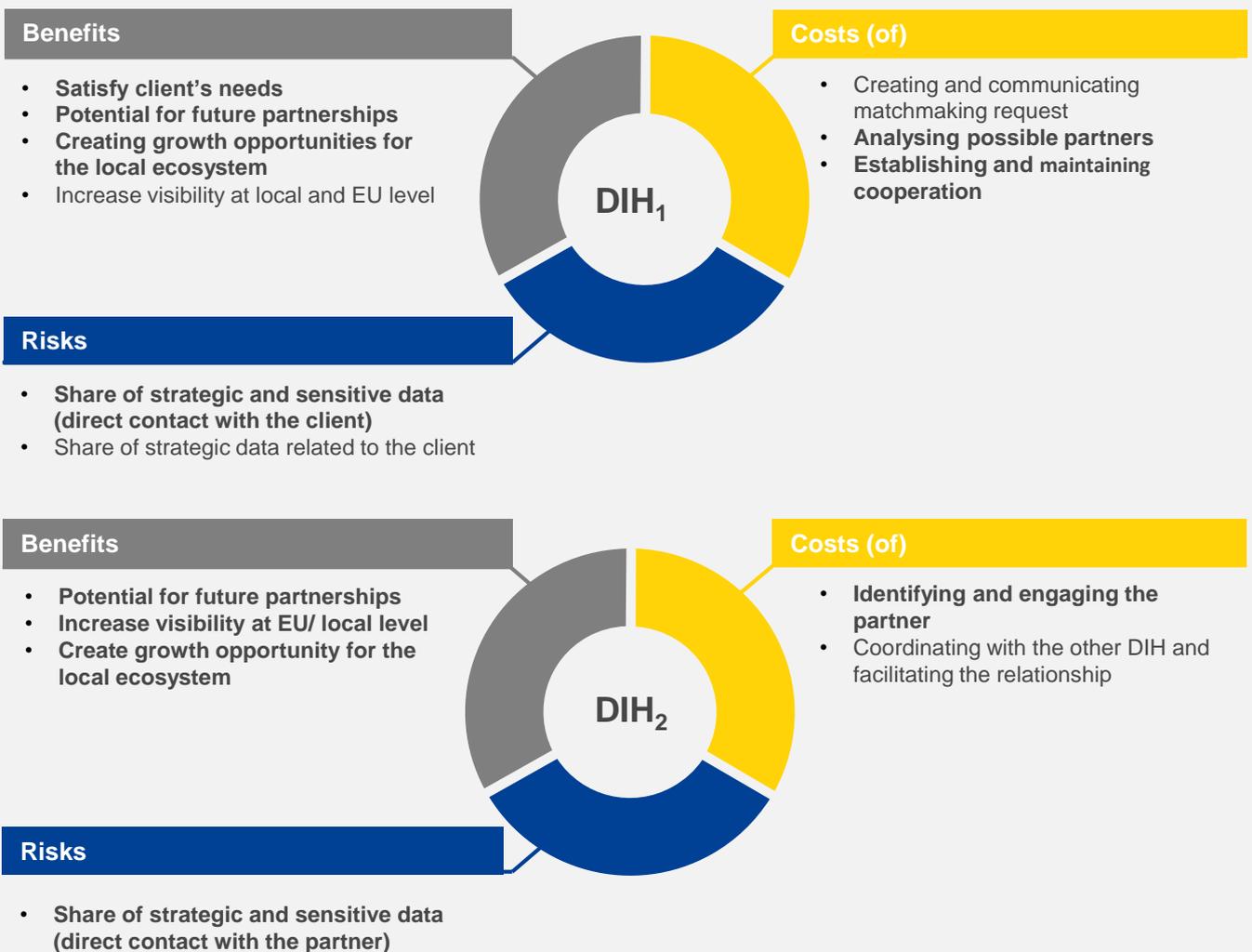


# The Cooperation Scenarios

## Matchmaking: costs, risks and benefits

The analysis of costs, benefits and risks of the players involved in the cooperation scenario highlighted that its applicability can be enhanced by:

- Inclusion of non-compete clauses in the cooperation agreement that can, if deemed necessary, protect the exclusivity of the relationship between the DIHs and actors belonging to their local ecosystem. Similar agreements shall be limited as to duration and shall expressly set material and territorial scope.
- Financial incentives to support DIHs to kick-off matchmaking activities. Indeed, DIHs might need to review their business and governance model in order to be able to engage in cross-border matchmaking activities, while the success of this kind of cooperation is ensured by a large participation from DIHs across the EU.
- Active participation of the DIH to international networking events, face-to-face meetings and working groups with other DIHs, in order to build trust and to ease following matchmaking activities.
- An active online presence of the DIH to facilitate networking and matchmaking activities. This should happen both on horizontal platforms provided by third parties and through the DIH own communication channels.



*Most relevant costs, benefits and risks in bold*



# Policy recommendations to strengthen cooperation

Based on the experience gained during the AI DIH Network project and based on the feedback gathered from DIHs, we have defined a set of recommendations for the European Institutions for promoting DIH collaboration.

These actions refer to three main topics:

- Potential solutions for supporting DIH collaboration under the Digital Europe Programme
- Horizontal tools and initiatives that would improve DIH reciprocal knowledge, reinforcing networking and creating opportunities for collaborations;
- Actions to ensure a coordinated and consistent development of DIHs.

## Supporting DIH collaboration in the Digital Europe Programme

### Experiment and demonstrate the effectiveness and benefits of the cooperation scenarios within EU programmes and projects

Collaboration among European DIHs is one of the aspects that are expected to be supported by the upcoming Digital Europe Programme. The current version of the DEP reports different types of collaboration that will be supported, aiming to leverage DIH capabilities and infrastructure to serve other regions and creating connections among ecosystems.

The collaboration scenarios developed within the AI DIH Network can represent a starting point for implementing these use cases. Using similar schemes within the DEP (and within other EU projects under Horizon 2020 and Horizon Europe) would help to reinforce these mechanisms and to make DIHs familiar with structured collaboration.

Further, other scenarios connected to the implementation of additional use cases presented in the DEP or related to the collaborations in other specific technological domains could be developed, preferably through a bottom-up approach.

#### Recommended actions:

- Encourage the definition of additional cooperation scenarios, corresponding to other collaboration use cases or to specific needs of technological fields different from AI
- Promote the use of the cooperation scenarios for the projects to be launched under Horizon2020, to test and refine them in the view of the Digital Europe Programme
- Foster the use of the scenarios (of other schemes developed with the contribution of DIHs) to implement the collaboration use cases of the DEP.

### Define additional cooperation mechanisms for European DIHs and other DIHs

The Digital Europe Programme will introduce a new classification among DIHs, by selecting European DIHs from a list of candidates prepared by Member States.

EDIHs will receive funding for strengthening their capacity - by investing in equipment, facilities and employees to provide services for their ecosystems - and for establishing collaborations, especially at cross-regional level, as they will receive travel grants to work with other hubs. The other DIHs, which have been receiving funding under Horizon 2020 and in the context of regional and national programmes, will continue to operate in parallel.

Defining mechanisms for structured collaboration among EDIHs and DIHs would reinforce their impact on the European ecosystem. DIHs are higher in number compared to EDIHs and have already established connections with their ecosystems that can be exploited to transfer EDIHs capabilities.

To define collaboration schemes, benefits and costs of collaboration between EDIHs and other DIHs should be analysed. The analysis should start from the existing collaborations, refining the schemes in place by taking into consideration feedback gathered directly by the potential involved partners. This would lead to the identification of factors preventing cooperation and provide information on the incentives and measures that can support it, within the Digital Europe Programme and in other contexts.

#### Recommended actions:

- Define potential schemes for collaboration between EDIHs and DIHs and assess benefits and costs of the parties involved by adopting a bottom-up approach
- Identify suitable measures to overcome eventual barriers and obstacles for cooperation.

### Incentivise collaboration until it becomes a well-established mechanism

As emerged from the analysis of costs and benefits of cooperation scenarios developed within the AI DIH Network, working together requires DIHs an effort in terms of time and resources.





# Policy recommendations to strengthen cooperation

Accordingly, DIHs willing to cooperate should dedicate resources to ensure knowledge sharing, to build their networks and invest into establishing specific collaborations. This entails substantial, additional costs, that DIH may not be able to cover. DIH customers may not be able or willing to pay more for services that are developed and/or delivered in collaboration with other DIHs, and regional governments may not be able to provide additional funding.

On the other hand, the effort required may be reduced once some of the tasks and processes needed to establish cooperation become consolidated and well-functioning. Further, it can be expected that when collaboration happens on a regular basis its benefits for the DIHs will become more relevant and have a positive impact on the sustainability of the whole process.

Providing financial incentives for DIHs to undertake cooperation may help them in covering the additional costs they sustain and could represent the motivation needed for making collaborations happening regularly in the future.

## Recommended actions:

- Assess in detail the financing needs of the DIHs involved in cooperation in terms of most relevant costs that should be sustained by the DIH
- Identify the most suitable support that can be offered, the adequate amount of aid to be provided and the mechanism for its distribution.

## Ensure support to settle legal aspects of collaboration

The analysis performed showed that legal solutions are often needed to facilitate collaboration happening on a regular basis as they mitigate some of the main risks perceived by DIHs in being involved in the different collaboration scenarios.

Most DIHs have experience in cooperating within EU projects and initiatives, that are usually regulated by standard grant agreements and consortium agreements. Collaborating outside the EU framework requires the development of ad-hoc agreements, including clauses to agree on responsibilities and rights of the partners especially for what concerns their relationships with the clients.

Not all DIHs can count on a legal department responsible for managing these aspects. This may prevent DIHs to undertake collaboration activities or, at least, create administrative barriers and lead to longer times required for establishing cooperation.

A first, cost-effective solution to avoid such barriers is to make available to DIHs standard templates for the different cooperation scenarios which they can adapt based on their needs. To facilitate the use of these templates and to support the development of additional agreements, a legal helpdesk could be set up. Such support should answer to DIH doubts in terms of collaboration and share best practices in terms of agreements for collaborations.

## Recommended actions:

- Develop and make available example of agreements DIHs can use to settle legal aspects of collaboration and engage into collaborations without incurring into administrative barriers
- Set up a legal helpdesk, supporting DIHs in resolving their doubts on legal aspects of collaboration.

## Reinforce thematic communities within the Digital Transformation Accelerator

The larger the community, the more complex it is to identify common interests, build trust and cooperate effectively. By implication, these goals are much easier to achieve in a smaller community.

The dual approach of a large DIH community and smaller thematic groups is recommended as the way forward, when creating communities within the Digital Transformation Accelerator.

The smaller thematic groups would be based on DIH competences and focus and would carry out coordinated initiatives in specific fields, as AI (e.g. working on the possibilities to enforce AI Ethical Guidelines, identifying tools and services to develop jointly, etc.).

## Recommended actions:

- In the definition of the operating model of the Digital Transformation Accelerator, consider the opportunity of creating thematic communities focusing on specific aspects and/or technologies
- Define the criteria to allocate DIHs to the thematic communities and assign task to them.

## Define the competency framework of European Digital Innovation Hubs

To deliver a wide set of services - from ecosystem management to specialised technological support - a variety of soft and technical skills must be leveraged.

The definition of a minimum set of competences that a European Digital Innovation Hub should have would help DIHs to understand how to improve their internal structures.

It would also be beneficial to the EDIH selection process to establish eligibility criteria, in terms of access to skills and competences, that DIHs would need to meet.

## Recommended actions:

- Identify the competences, knowledge and skills required for providing services expected by European Digital Innovation Hubs (including specialized technological services)
- Develop a competence framework to be used by EDIHs and stakeholders involved in the implementation of the DEP.



# Policy recommendations to strengthen cooperation

## **Reinforce the assessment of DIHs services and infrastructure in the selection of European Digital Innovation Hubs to ensure consistency and to create a cohesive community**

One of the main barriers to DIH cooperation is related to trust. Does a potential partner have the necessary competences and capabilities to be a good partner? Can we trust their quality of service?

One way to help to build trust within the DIH community would be to introduce independent DIH assessments, including project evaluations and onsite inspections of DIH organisational structures and infrastructure assets.

To better measure the effectiveness of DIH activity, DIH service delivery assessments could also be improved by

introducing ad-hoc indicators to evaluate the quantity and quality of the services provided.

### **Recommended actions:**

- Define common European criteria for assessing DIH capabilities, technical and infrastructural endowment during onsite inspections
- Introduce the onsite inspections within the evaluation mechanism foreseen for the selection of EDIHs
- Define the most cost-effective option for performing onsite inspections, e.g. limiting the target to the DIH designated by Member States (or a sample of them) and involving local, independent evaluators.





# Policy recommendations to strengthen cooperation

## Horizontal actions to support networking and cooperation

### Develop and promote a standard classification for DIH services and skills

The state of the art in terms of mapping DIHs and their services is characterised by the presence of many different sources of information and different classifications in use. The main source of information is the JRC Catalogue, including data on 528 Digital Innovation Hubs, based on their self-declaration. However, information on DIHs is replicated within other sources, internal to specific projects, e.g. I4MS website, AI DIH Network platform, etc. The description of the services and skills reported in these databases can be different and often does not provide immediate and unique understanding of the activities and competencies entailed, as the labels used for the services can be rather generic, not enabling a clear identification of the meaning.

The risk of misunderstanding may discourage the use of these catalogues for the identification of suitable partners. On the contrary, developing standard, specific names for the services offered by DIHs would facilitate them in identifying other hubs with similar/ complementing competencies.

#### Recommended actions:

- Define a common set of services to be used by all DIHs (regardless of their specific technological focus) starting from the analysis of the activities currently performed by DIHs
- Determine whether additional services should be included or specific activities should be further detailed to reflect any specificity of technological domain/ focus
- Promote the use of the standard ontology developed in every project/programme and for mapping DIH competencies and services
- Using the ontology developed, determine minimum characteristics (services and competences) of DIHs working in specific fields, such Artificial Intelligence.

### Organize European workshops and demo-days for the participation of DIHs with competences in concrete technological disciplines

The need, awareness and willingness for cooperation among DIHs are understood to increase significantly when they can complement and offer each other punctual expertise/ resources/ facilities in very specific fields within other larger and wider technological disciplines (like Artificial Intelligence).

The organization of events at a European level under the form of technology-specific workshops and demo-days represents a meaningful opportunity for the demonstration of potentially sharable capabilities of DIHs.

Those capabilities may be stressed by the presentation of recent regional projects, uses cases and best practices where examples of digital-wise solutions applied to solving companies' problems are addressed.

Such events may also embrace networking options for the DIHs to maintain B2B discussions and more easily identify niches for short-term cooperation based on their actual capabilities and gaps within the concrete technological discipline covered by the event.

#### Recommended actions:

- Organise periodical workshops and demo-days focusing on demonstrating experience and capabilities to promote DIH reciprocal knowledge and stimulate the identification of fields for cooperation.





# Policy recommendations to strengthen cooperation

## Develop a unique, proactive platform for supporting DIHs collaboration

Virtual tools and platforms are useful tools to support collaboration among organisations located in different regions. This applies also to DIHs which can use such tools to share materials, take part into discussions, learn about potential partners, etc. in a cost-effective manner.

As many other European initiatives focussing on collaboration, the participants of the AI DIH Network had the possibility to connect through a dedicated platform, designed for this purpose. Yet, some participants were reluctant in using the platform, especially at the beginning of the project, as they had to submit again information they had already provided for other tools and initiatives (e.g. profile, DIH profile and services, etc.).

During the workshops with DIHs, feedback on how to improve the uptake of the platform and similar existing tools have been gathered. Besides the need for streamlining the number of existing platforms and the information required, it was suggested to develop a proactive tool, that encourages users' interaction and connection.

The platform should be able to send notifications and periodical activity feeds as well as to suggest interesting partners, discussions and materials based on the latest activities of the user. In addition, the link between the platform and other existing tools should be ensured. On the one hand, users should have the possibility to import data from the different platforms in a seamless and easy-to-use manner (i.e. with DIHs being able to easily transfer the data from their platform to the general collaborative DIH platform).

On the other hand, the general collaborative DIH platform should be automatically updated with the most recent information from the different platforms when these are changed, which would allow DIHs to use their own, smaller platforms while having the advantage of using the general collaborative platform as database, benchmarking and collaboration tools.

### Recommended actions:

- Gather data on the use and access of the different platforms developed in the context of European initiatives and projects involving DIHs
- Based on the analysis of the use of the existing platforms and on the needs it should respond to, define the set of functionalities of the platform. Among them, consider those ensuring the possibility to engage the user through notifications and suggestions and those enabling the connection with other existing platforms
- Define the financing and operating model of the platform, ensuring it can be accessed by any DIH and it remains available to interested DIHs over time (i.e. its existence is not limited to a specific initiative or project).

## Establish a sustainable independent back office function to animate and coordinate long-term DIH Network collaboration and growth

Discussions with the DIHs and analysis of the cooperation scenarios confirm their interest and commitment to mutually beneficial collaboration. In most cases, however, DIH-DIH collaboration tends to be limited to the scope of publicly funded projects (e.g. EU-funded). This largely reflects the traditional public-funding system of many DIH partners – i.e. it is a form of collaboration that they are accustomed to and which they rely on as a source of revenue. Extending collaboration into other areas that they are less accustomed to – e.g. joint DIH service development or smart matchmaking in a cross-border context, with a fee-paying element – requires a cultural change within many DIH partners and collectively (across all DIH partners). To make that shift, DIHs require expert assistance and support.

To animate and coordinate long-term DIH Network collaboration and growth, some sort of back office function is required. A key observation from our discussions with the DIHs is that this type of network support function is not something that one or multiple DIHs can collectively provide. The DIHs each have limited financial and human resources. They also take the view that a network support function should have a significant degree of independence from the DIHs that its supports to ensure fairness and balance.

Clearly, a support function of that type will need to be funded. Finding an appropriate balance between DIH contributions (e.g. fees), at an acceptable level, and public funding sources is the key challenge.

### Recommended actions:

- Define responsibilities and objectives of the back-office function for supporting DIH collaboration
- Determine the connected costs and suitable financing strategies
- Implement the back-office function.





# Policy recommendations to strengthen cooperation

## Future development of DIHs

### Ensure consistency and coordination among the different initiatives connected to AI and DIHs

A number of initiatives are already in place or will be launched in the future by SMEs and public administrations, involving DIHs, competence centres, research centres and other stakeholders to promote the uptake of AI and digital solutions

For instance, under AI4EU, the AI on-demand platform has recently been launched and a new call for its consolidation will be closed in April 2020. At the same time, other initiatives aiming to create a network of experts in AI, like CLAIRE, have been promoted.

The existence of multiple initiatives sharing similar objectives characterizes the world of DIHs. DIHNET project has gathered a large community of DIHs with the aim of creating a pan-European network of DIHs. While, other networks focusing on specific fields, such as the AI DIH Network, RODIN in robotics, DIH-HERO in healthcare have been created within EU projects and initiatives.

Synergies among these networks are observed, also because many DIHs are involved in more than one initiative.

However, to reinforce cooperation, coordination should be sought by design. It is therefore recommended to create a framework where all existing initiatives are included and define a plan for their coherent future development and organisation.

The strategy should entail also other connected investments, such as the Testing and Experimentation Facilities foreseen under the DEP, to ensure the optimization of effort and investments.

#### Recommended actions:

- Map the characteristics, objectives and members of the initiatives in place
- Define a framework, coherent with the relevant action plans and policy priorities, where future and current initiatives will enter
- Establish cooperation and coordination mechanisms between initiatives in place/ planned and the other connected investments.

### Leverage DIHs to pursue EU priorities

DIHs are expected to play a relevant role in creating awareness on AI and promoting the uptake of AI solutions by SMEs and other stakeholders in their ecosystems, as stated in the White Paper on Artificial Intelligence by the European Commission. DIHs can count on geographical proximity to reach their stakeholders, which contributes to increase the effectiveness of dissemination and communication activities.

This strength can be exploited to further promote the implementation of AI and other EU priorities across Europe. For instance, DIHs could be involved in the definition of common European methodologies for the enforcement of the Ethics Guidelines for Trustworthy AI - developed by the AI High-Level Expert Group (AI HLEG) - in line with the outcomes of the pilot of the corresponding Assessment List. Their role could also entail an evaluation of whether

projects and solutions developed in their ecosystem are coherent with ethical guidelines or not, and the support of practical operationalisation of AI ethical principles. This would help DIHs in reinforcing their role in the ecosystem and would promote the creation of a common European certificate/ label on trustworthy AI.

#### Recommended actions:

- Identify policy priorities that would benefit for implementation at the regional level, thanks to EDIHs and DIHs
- Define a common action plan for involving EDIHs and DIHs across Europe in the context of the priorities identified.

### Prepare DIHs to work with the Public Sector

In the context of the DEP, EDIHs will support public administrations through a wide range of activities: promoting the adoption of interoperability solutions, European Digital Service Infrastructures and building blocks (e.g. eID, eInvoicing, eDelivery, eSignature); supporting them with specific services (e.g. providing testing facilities or developing AI solutions) as well as working with GovTech companies (e.g. SMEs, innovative start-ups, etc.) providing services to public administrations.

However, to reach this objective DIHs should improve their capacity of working with the public sector as well as their knowledge of e-government and interoperability solutions.

The discussions with the members of the AI DIH Network highlighted that only a limited number of DIHs have experience in working with public administrations, while most of them target SMEs as their main users.

Dealing with public sector organisations requires specific skills that European DIHs will need to develop, including both transversal (e.g. procurement, communication, etc.) and technical skills.

It is therefore recommended to map the services that European DIHs are expected to provide to public administrations, build a coherent framework in terms of skills and help DIHs in acquiring those skills.

#### Recommended actions:

- Define EDIH service portfolio for public sector organisations following a customer-centric approach to identify the needs of the final users (e.g. local governments and municipalities, regions, national public administrations) and avoiding competition with commercial services (in line with State Aid provisions)
- Identify the skills that EDIHs should acquire/ develop to deliver the service portfolio
- Determine the most appropriate methodologies to support EDIHs in acquiring/ developing the skills identified (e.g. setting up dedicate learning programmes, providing guidance for the recruitment process, etc.).

AI Digital Innovation Hubs Network

D10 – Final Study report

Smart 2017/0001

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April, 2020

Presented by PwC EU Services EESV, in partnership with CARSA and Innovalia, to the European Commission, Directorate-General for Communications Networks, Content & Technology

