THE ROLE OF DIHS IN THE IMPLEMENTATION OF THE EUROPEAN AND NATIONAL DIGITALISATION PROGRAMMES

EL PAPEL DE LOS DIH EN LA IMPLEMENTACIÓN DE LOS PROGRAMAS DE DIGITALIZACIÓN EUROPEOS Y NACIONALES

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ABSTRACT: Digitalisation is key to increase competitiveness. This paper surveys the Digital Europe Programme as well as the Portuguese and Spanish national strategies. The role of the Digital Innovation Hubs to support the digital transition, as orchestrators and access points for the latest digital capacities, and the process to establish the European network of hubs is addressed. Finally, two case study of DIH are presented, PRODUTECH DIH and DIGIS3.

KEYWORDS: digitalization programmes; EDIH; DIH; digital innovation Hub.

Resumen: La digitalización es clave para aumentar la competitividad. Este documento analiza el Programa Europa Digital, así como las estrategias nacionales de Portugal y España. Se aborda el papel de los Digital Innovation Hubs para apoyar la transición digital, como orquestadores y puntos de acceso a las últimas capacidades digitales, y el proceso para establecer la red europea de hubs. Por último, se presentan dos casos de estudio de DIH, PRODUTECH DIH y DIGIS3.

Palabras clave: programas de digitalización; EDIH; DIH; digital innovation hub.

1 Digital Europe Programme (DIGITAL)

1.1 Overview

Within the Multiannual Financial Framework a proposal was made to establish the Digital Europe Programme (DIGITAL) for the period 2021-2027 that was adopted on June 2018 by the European Commission. In march 2021 the Council adopted the Programme and on the 29th of April [1] it was adopted by the European Parliament. On the occasion of the adoption by the Council, Pedro Nuno Santos, Portuguese Minister for Infrastructure and Housing and President of the Council, stated at that date that *«The Digital Europe Programme is part of the EU's strong push to make the most of digitalisation for the benefit of its societies and economies, increase its autonomy in key technologies and bolster its competitiveness. It will help us build high-performing and secure state-of-the-art digital services for all citizens and businesses across the Union».*

DIGITAL will start retroactively from 1 January 2021 and run until 2027. It was assigned a budget of €7 588 million. Nevertheless, DIGITAL will not stand alone, but rather complement other EU programmes, such as the Horizon Europe programme for research and innovation and the Connecting Europe Facility for digital infrastructure.

The general objectives of DIGITAL are to support the digital transformation of industry and to foster better exploitation of the industrial potential of policies on innovation, research and technological development, for the benefit of citizens and businesses across the Union, including its outermost

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regions and its economically disadvantaged regions. Furthermore, also aim to better align Union, Member State and regional policies, and to pool private and industrial resources in order to increase investment and develop stronger synergies.

The Digital Europe programme lies on 5 interlinked specific objectives that reflect key policy areas: High Performance Computing (~29% budget); Artificial Intelligence (~27%); Cybersecurity and Trust (~22%); Advanced Digital Skills (~8%); and Deployment and Best Use of Digital Capacities and Interoperability (~14%).

The general objective of supporting the industry digital transformation will have a strong focus on small and medium-sized enterprises (SMEs).

The Digital Europe programme is covered by several work programmes, each one dedicated to one or more specific objective(s) funded by the programme: DIGITAL Europe Work Programme 2021-2022; DIGITAL Europe - European Digital Innovation Hubs Work Programme 2021-2023; and, DIGITAL Europe –Cybersecurity Work Programme 2021–2022.

In this paper the focus is on the European Digital Innovation Hubs, as orchestrators and access points for the latest digital capacities, that were given a central role in the implementation of the Programme.

1.2 European Digital Innovation Hubs

European Digital Innovation Hubs (EDIH) should act as single-entry points for companies to access tested and validated technologies but also to promote open innovation. In addition, it will be their role to foster advanced digital skills. The network of EDIHs will share best practices and specialised knowledge and will be able to support companies and public administrations in any region and economic sector, thus also following the objective of a more cohesive, resilient and competitive EU.

The Programme will finance a network of European Digital Innovation Hubs that should ensure broad geographical coverage across Europe and should contribute to the participation of the outermost regions in the Digital Single Market.

Potential candidate EDIH to the initial network will be proposed by each Member State following a national open and competitive process.

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The workprogramme of Digital Europe Programme is under development but a draft working document, developed by The European Commission, on the European Digital Innovation Hubs in Digital Europe Programme is public and its version of 25 of January 2021 allows the sum-up that follows [2]. This document explains how European Digital Innovation Hubs will be implemented in Digital Europe Programme, how it will be complemented in the support to digital transformation of the economy by other EU programmes, and how it contributes to building a successful network of hubs covering all regions of Europe. A schematic overview of the role of EDIHs in Digital Europe Programme is presented in Figure 1.
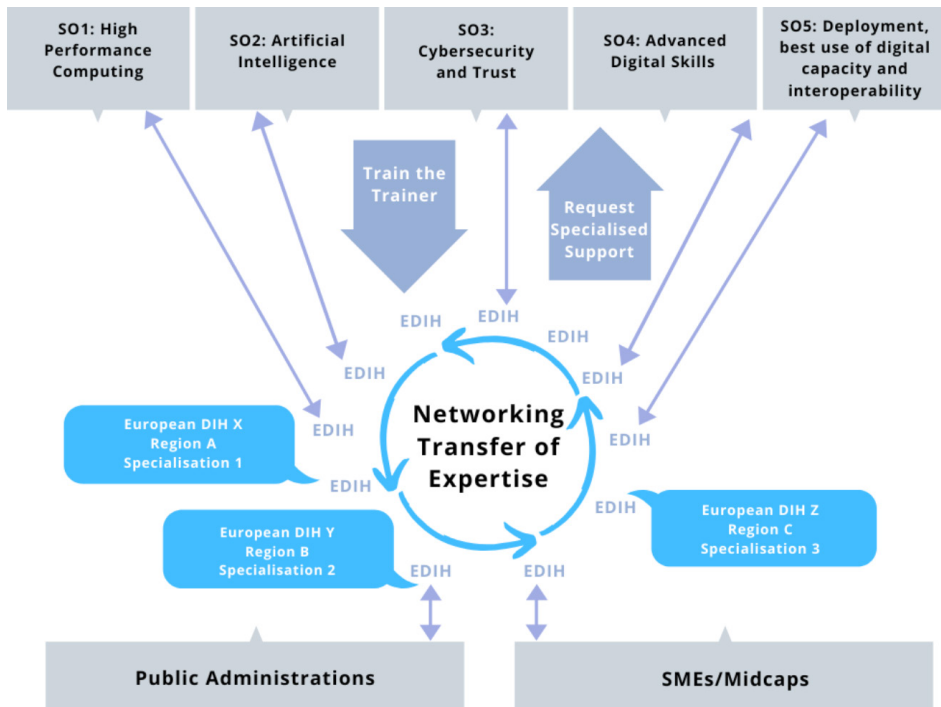

Fig. 1. Schematic overview of the role of EDIHs in Digital Europe Programme SOURCE: «European Digital Innovation Hubs in Digital Europe Programme Draft working document 25 01 2021» [2].

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EDIH: Organisation, Knowledge transfer and Services [2]. A EDIH can be a single legal entity or a consortium of legal entities, governed by a consortium agreement or similar, with complementary expertise and with a not-for-profit objective.

The organisation, composition, and governance structure of the EDIH is defined by the partner entities but should cover at least the technology side and the business development side, and be capable of doing effective outreach. They should also have appropriate links to companies and/or public sector organisations.

European Digital Innovation Hubs will work closely with the relevant specialised centres or consortia responsible for the different Digital Europe Programme (DEP) projects to make sure that companies and public administrations are aware of the developed knowledge and technology and can experiment with those technologies and apply them according to their needs. Special horizontal support activities are foreseen to support the necessary knowledge transfer from the DEP Specific Objectives towards the EDIHs and vice versa.

EDIHs shall support companies – especially SMEs and mid-caps – and/or the public sector in their digital transformation, and for such offer services such as:

- Test before invest: including awareness raising, digital maturity assessment, demonstration activities, visioning for digital transformation, fostering the integration of various technologies, testing and experimentation with digital technologies, knowledge and technology transfer.
- Skills and training: namely training, boot-camps, traineeships and job placements.
- Support to find investments: in particular, access to financial institutions and investors, supporting the use of InvestEU and other relevant financing mechanisms.
- Innovation ecosystem and networking: serve as brokers and matchmakers between e.g. end-users (private or public) and potential suppliers of technological solutions for e.g. experimentation and testing or solutions co-creation.

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EDIH network: Selection process. The funding of the selected EDIH will be in the form of grants, and is expected to reach 100-200 EDIH in the first year. Each Member State has launched a national open and competitive process that will result in a list of designated hubs in each Member State, that should have geographical coverage of the country and respond to the demand of industry and public sector while taking into account existing assets of the country. The designated potential hubs will be invited by the European Commission to respond to a restricted call for proposals with a certain deadline. The eligible proposals will be evaluated by external experts and all of those above threshold will be ranked, and Member States will endorse the ranking of the proposals. Finally, the selected proposals will get a grant from the European Commission. If after this process there are still gaps in the coverage of the network of EDIHs, open calls may further complement the network. It is expected that the EDIHs will start working in early 2022.

A table with the foreseen distribution of funding of Digital Europe Programme for EDIHs in all MS was presented, but for the purpose of this article only data for EU, Portugal and Spain, the 2 countries involved in the DISRUPTIVE Interreg project, are presented (Table 1).

Table 1. Number of hubs foreseen for each country SOURCE: Adapted from «European Digital Innovation Hubs in Digital Europe Programme Draft working document 25 01 2021» [2].

Country	Projected budget (1000€)	Min # of hubs	Max # of hubs (recommended)	NUTS regions
Portugal	22,251	3	6	7
Spain	62,515	9	18	19
Total EU	747	107	211	240

At the time of this paper, May 2021, 330 entities were self-registered on the European Commission's S3 platform as candidate EDIHs [3].

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2   Portuguese and Spanish national Digital Strategies

2.1 Portugal's Action Plan for Digital Transition

Portuguese digital journey aims to converge with Europe and as such was reinforced as a strategic priority and essential vector of the country's economic growth. On April 2020 the Council of Ministers approved the «Action Plan for the Digital Transition» [4] assumed as the country's transformation engine, aimed at accelerating Portugal, leaving no one behind, and projecting the nation in the world.

The structure of the Plan has 3 main action pillars and an added cross-cutting catalyst dimension that is an accelerating instrument for the digital transition:

- Pillar I – Capacity building and digital inclusion.
- Pillar II – Businesses' digital transformation.
- Pillar III – Public services' digitalization.
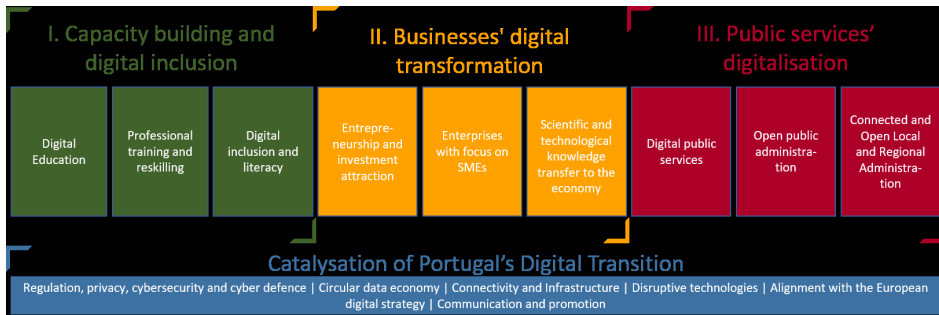- Catalysation of Portugal's digital transition.

Fig. 2. Portuguese Action Plan, fundamental pillars, sub-pillars and cross-catalyst dimension. SOURCE: Adapted from «Presentation Portugal Digital – março 2021» [5].

The global coordination of the Action Plan belongs to «Portugal Digital Mission Structure», that is responsible for ensuring the links with the different structures involved in the measures, their implementation and results reporting, as well as promoting the Action Plan.

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Digital Innovation Hubs for Entrepreneurship (measure 8) are integrated in pillar 2, sub-pillar scientific and technological knowledge transfer to the economy.

Given the significant differences in digitisation levels, both regionally and sectorally, building a network of Digital Innovation Hubs is key to ensuring that all businesses can take advantage of digital opportunities. The aim of this measure is to stimulate a national network of Digital Innovation Hubs to be developed in connection with the competitiveness clusters and technological interface centres. This network will be interconnected with the European network of hubs to be boosted by the European Commission in the scope of the European framework programmes for 2021-2027.

The Portuguese network of DIHs: the recognition process. In December 2020 the Regulation on the Process of Recognition of the Digital Innovation Hubs and Access to the European Network was published under Order nr. 12046/2020 [6]. It is expected that the applicant consortiums present projects aligned with the pillars of the national strategy and contribute to an adequate territorial and sectoral coverage avoiding overlapping and maximizing synergies and complementarities. Those DIHs aiming at integrating the EDIH network have to demonstrate their added value at European level and have competences in the key digital technologies of DIGITAL presented in Figure 1. The open call for the selection process was published in mid-December 2020 with due date in February 2021. The evaluation of the applications is, at the date of this paper, ongoing. 10 DIH will be selected for national recognition, nevertheless at this stage, in the EC S3 platform, 28 Portuguese DIH have registered as EDIH candidates [3].

2.2 Spain's Agenda for Digital Transition

Spain Digital 2025, presented in July 2020, will focus its objectives on promoting the country's digital transformation as one of the fundamental levers to relaunch economic growth, reduce inequality, increase productivity and take advantage of all the opportunities offered by new technologies, with respect to constitutional and European values, and the protection of individual and collective rights [7]. The agenda consists of 50 measures structured around 10 axis:

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1. Digital connectivity

2. 5G technology

3. Digital skills

4. Cybersecurity

5. Digitisation of Public Administrations

06. Accelerate the digitization of companies

07. Digital transformation driving projects

08. Spain as a European audiovisual platform

09. Data economy and Artificial Intelligence

10. Digital rights

Fig. 3. Spain Digital 2025 – the 10 axis SOURCE: Adapted from «España Digital 2025» [7].

The Government has created the Consultative Council for Digital Transformation, which will have a public-private nature and will facilitate dialogue and participation of the different economic and social agents for the digital transformation of the country.

The SMEs Digitization Plan, 2021-2025, includes a Support Programme for Digital Innovation Centres (CID), developed by the General Secretariat for Industry and SMEs with an investment of EUR 42m for the development of

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CID and these can provide information, services and facilities to successfully address SME digital trans-formation projects.

The Spanish network of DIHs: the application process. In October 2020 the Spanish Ministry of industry, trade and tourism opened in October 2020 a public call for expression of interest [8]. This call for expression of interest (EOI) was made with a dual purpose: on the one hand, to identify national candidates interested in joining the European Network of DIH promoted by the Commission, and on the other, to know the current status of their potential applications. This EOI featured a preliminary element and aimed not only to facilitate and speed up the national pre-selection procedure but also to promote the submission of quality proposals taking into account the characteristics of the national ecosystem.

In February 2021, all the applicants who had submitted the mentioned EOI, a total of 40, were informed on their official approval by the Ministry as Spanish EDIH candidates.

3 DIH Case studies

3.1 PRODUTECH DIH

PRODUTECH is currently host of 2 Digital Innovation Hubs, PRODUTECH DIH Platform [9] and iMan Norte Hub[10]. Within the framework of the Portuguese DIH recognition and access to the EDIH network process a single proposal consolidating the track record of this 2 DIHs was submitted. At the date of submission of this article, the evaluation process is still ongoing.

Although nowadays independent in their work, the initiatives have different «geometries» (members), geographical scope and focus, nevertheless, and due to PRODUTECH hosting of both, synergies are explored within its articulated operation.

PRODUTECH DIH Platform is a national DIH encompassing the relevant stakeholders, namely competence centers and labs, R&D organizations, sectoral technology centers, industry associations, production technology providers, leading users from the manufacturing industry, education/training centers and other stakeholders. It has a multi-sectorial coverage (via the

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technological centers comprised by the cluster) and has as intervention domain the Manufacturing Industry as a whole.

iMan Norte Hub focuses on cyber-physical production systems and robotics, gathers a consistent set of stakeholders with track record in supporting the digitalisation of companies and as the Norte region of Portugal as intervention domain. It has its genesis within the scope of the EU project BeinCPPS. iMan Norte Hub is operationalized by a Memorandum of Understanding established between its members and is co-coordinated by PRODUTECH, INESC TEC, UPTEC and 4 sectorial technological centers (CTCOR, CATIM, CITEVE and CTCP).

The relevance of both initiatives has been recognized nationally and internationally, notably, just to cite some examples:

– PRODUTECH DIH Platform is one of the selected DIHs of AI DIH network [11];
– Both DIHs are mentioned in the JRC Technical Report on «Digital Innovation Hubs in Smart Specialisation Strategies» [12] and in the document sponsored by the Portuguese Government «Portugal IN-CoDe.2030- AI Portugal 2030» [13].

The success of the initiatives can also be measure by the participation in European projects:

– PRODUTECH DIH Platform, via PRODUTECH, is part of DISRUPTIVE (INTERREG-POCTEP), DIH2 (H2020) and DIH-4CPS(H2020) [14];
– iMan Norte Hub takes part in SmartEes (H2020), via CENTI, AgROBOfood, SmartAgriHubs and i4MS, all latter 3 are H2020 and participates via INESC TEC.

3.2 DIGIS3

The general objective of the Digital Innovation Hub DIGIS3 [15] is to ensure the Intelligent and Sustainable Digital transformation mainly of SMEs and the public sector of Castilla y León, with an urban and rural territorial scope fo-cused on cohesion.

The key is comprehensive support for users, facilitating their access to specialized technical knowledge and experimentation environments, in a

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one-stop-shop service whose central core of knowledge and training is structured around Artificial Intelli-gence and Supercomputing, complemented by others support technologies in digitiza-tion such as IoT, Big Data, Blockchain and Robotics among others.

This support is carried out through a portfolio of services and suitable digitization itineraries, according to the level of digital maturity of the users, and which also takes into account the specific needs of the sector and the geographical environment.

This regional digitization initiative is aligned with the priority sectors of the RIS3 of Castilla y León and has a focus on 4 application domains: Industry 4.0; Agro smart; Smart Territories, Smart Administration and establishes 4 Strategic Pillars: Global Sustainability; Skills; Capillarity; Cooperation-Networks.

DIGIS3, led by the Institute for Business Competitiveness of Castilla y León (ICE), has emerged as a result of the continuous growth of the existing DIHs in the region and is formed by the following entities:

— The AIR Institute technology center, as a center of competence in Artificial Intelligence of IoT DIH, Digital Innovation Center focused on the use of IoT technologies in production processes, products and services of companies.
— The DIHBU association, Digital Innovation Center expert in Industry 4.0, formed by industrial companies, knowledge centres, and developers in Industry 4.0 solutions in Castilla y León.
— The DIH-LEAF association, Digital Innovation Center oriented to the lives-tock, environmental, agricultural and forestry sectors, involving, among others, universities and technology centres, companies and producer associations, in order to respond to the challenge of digitization and technological innovation of this broad productive sector.
— The Castilla y León Supercomputing Center Foundation (SCAYLE), as an expert partner in supercomputing.
— The University of León as an expert partner in supervision, control and automation of industrial processes and critical infrastructures as well as in Industry 4.0, Internet of Things, Data Science, Artificial Intelligence, Computer Vision, Robotics, Additive Manufacturing or Aerospace Technology.

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The main stakeholders who are collaborating in this initiative are:

- Collaborating Entities: Group of entities committed to participating in its promotion and in the actions carried out in the Action Plan: clusters, tech. companies, industrial associations, chambers of commerce.
- Advisory Group: Relevant entities that provide a very important external point of view when defining and implementing the DIH strategy.

4   Conclusions

The digital transformation of the economy is key for Europe to remain competitive internationally. Four years after the launch of the Digitising European Industry Strategy and the eGovernment Action Plan, the European economy has made significant progress, but the level of digitalisation however remains uneven, depending on the sector, country and size of company: only 20% of SMEs in the EU are highly digitised. The Digital Europe Programme aims to support and accelerate the digital transformation of the European economy, industry and society, and to improve the competitiveness of Europe in the global digital economy.

EDIHs will play a central role in the Digital Europe Programme implementation, will have both local and European functions and will have their capacities increased to cover activities with a clear European added value and promoting transfer of expertise.

Finally, the COVID-19 pandemic clearly demonstrated how digital technologies enable resiliency for the society at large and will have a significant role in the economic recovery as there will be near future opportunities to integrate digital technologies and the know-how to make the best use of them. A working network of European Digital Innovation Hubs will be an important success factor.

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