Interreg

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Italy – Croatia

DIH InnovaMare

DIH INNOVAMARE PROJECT

D.2.2.3 Pilot Model Developed

Project identification
Project ID: ITHR0200416
Name of the lead partner organization: Hrvatska gospodarska komora
Name of the lead partner organization in English: Croatian Chamber of Economy
Project title: Cross-border digital innovation Hub for innovative marine technology
Project acronym: DIH InnovaMare
Program priority: Sustainable growth in the blue economy
Specific objective 1.1: Developed pilot program for cross-border mobility of researchers for stronger applied research by collaboration with quadruple helix actors in marine tech and blue economy on cross-border level
Project duration in months: 30
Work package: WP2 Innovation network for the development of innovative marine technologies for the sustainable blue economy
Activity title: A2.2 - Cross-border pilot program/model for talented young researchers to encourage collaborative RDI
Expected date: Period 4
Activity description: This model should be sustainable because it is based on needs of companies on one side and offer of expertise of young researchers. Needs of companies will be detected with survey conducted on 30 companies. Idea of mentors that are coming from companies is to bring practical knowledge and challenges that companies are facing so it can help young researchers to open cooperation with companies on specific challenges and activities. Mentoring sessions will be held based on the capabilities of mentors. We will organize 20 mentoring session that will be organized online and onsite. This pilot model will give us insight and understanding on how the process of detecting needs and young researchers who are fitting to those needs is implemented. Model will be developed as potential service of DIH Innovamare for companies and scientific-research institutions for matching and collaboration. Responsible partners are CCE and CNR - ISMAR.
Partner responsible: PP6 CNR
Dissemination level: CO-Confidential
Author: Giulia Bologna, Francesca De Pascalis
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Summary

1. Introduction and strategic context

The proposed industry–research collaboration model has been developed within the strategic and operational framework of the Digital Innovation Hub (DIH) Innovamare. This deliverable describes a pilot model currently under development, conceived to be progressively implemented, tested, and refined as a structured service of DIH Innovamare.
The objective is not to report final implementation results, but rather to define the operational architecture, the underlying logic, and the modalities for integrating the model into the DIH service portfolio.

The model builds on the results of the Innovamare ecosystem and is conceived as a structured, demand-driven, and sustainable service aimed at strengthening collaboration between enterprises and scientific research institutions in the Blue Economy sectors and related fields.

The Blue Economy represents one of the strategic pillars for sustainable, resilient, and competitive development of coastal and maritime territories. It encompasses a wide range of sectors, including maritime transport, ports, shipbuilding, offshore renewable energy, aquaculture, fisheries, environmental research and monitoring, marine biotechnologies, and sustainable tourism. These sectors are characterised by increasing technological, environmental, and regulatory complexity. In this context, structured collaboration between industry and research plays a crucial role in addressing current and future challenges.

Companies operating in the Blue Economy are required to respond to growing pressures related to the green and digital transitions, environmental sustainability, safety, resilience of marine systems, and competitiveness in global markets. These challenges demand innovative solutions that are difficult to develop exclusively within companies, particularly SMEs, which represent the backbone of the Italian and Croatian industrial fabric.

Scientific research, on the other hand, produces advanced knowledge, methodologies, and technologies that, if effectively transferred and applied, can generate significant economic and social impact. However, without effective mechanisms for interaction with industry, such knowledge risks remaining confined to the academic sphere.
Industry–research collaboration helps bridge this gap by transforming scientific knowledge into applied innovation, products, services, and sustainable processes. Structured collaboration models, such as those promoted by Digital Innovation Hubs and by the Interreg ITA–HR DIH Innovamare project, enable alignment between companies' innovation demand and research competences, fostering a demand-driven and results-oriented approach.

A distinctive feature of the Blue Economy must also be considered: the challenges affecting marine and coastal systems cannot be addressed through single disciplines but require a strong interdisciplinary

component and the integration of competences from different domains.

The main areas in which DIH Innovamare operates include:

- marine and environmental sciences;
- engineering (naval, mechanical, electronic, energy);
- digital and data-driven technologies (AI, sensing, big data, GIS);
- economics, management, and business models;
- social sciences and territorial governance.

Industry–research collaboration therefore becomes not only a channel for technology transfer, but also a space for interdisciplinary cross-fertilisation, where scientific, technical, and economic competences are combined to develop systemic and sustainable solutions. The DIH Innovamare project has specifically chosen to focus on young researchers, who represent a strategic resource in this process, as they often operate in interdisciplinary research contexts and can act as bridges between different languages, methods, and cultures.

An effective industry–research collaboration model generates benefits that go beyond individual projects or partnerships. Key systemic impacts include:

- acceleration of innovation processes and reduction of time-to-market;
- increased capacity of companies to adopt advanced and sustainable technologies;
- valorisation of human capital and development of hybrid skills;
- strengthening of local and transnational innovation ecosystems;
- increased participation in national and European funding programmes;
- contribution to environmental sustainability and marine resilience objectives.

Digital Innovation Hubs such as DIH Innovamare play a fundamental role in making this collaboration effective and structured. Acting as innovation intermediaries and technology brokers, they create the operational conditions for matching industrial needs with research competences, support interdisciplinary processes, and facilitate the transformation of ideas into concrete solutions.
The model developed within the Interreg ITA–HR DIH Innovamare project builds on these principles and aims to strengthen a tool that acts as an innovation facilitator, technology broker, and ecosystem orchestrator, supporting companies in accessing competences, technologies, infrastructures, and services needed to address complex innovation challenges.

2. Centrality of the survey as a methodological foundation

The collaboration model is based on a structured, evidence-based methodological approach in which the survey represents the core instrument to ensure relevance, effectiveness, and sustainability of the mentoring activities.

Within the pilot model, the survey is not an isolated data collection exercise but rather feeds the first phase of the operational workflow. Survey results enable DIH Innovamare to identify and categorise industrial challenges, technological needs, and competence areas, laying the foundations for subsequent analysis, clustering, and activation of interactions.
The questionnaire is a key methodological element of the project's mentoring model, ensuring that mentoring activities are grounded in clearly identified industrial needs and relevant research competences. Its design was guided by experience gained in previous mentoring activities and by direct interaction with stakeholders from both research and industry.

The questionnaire adopts a dual, demand-driven approach: on the one hand, it identifies concrete challenges and innovation needs of companies operating in the Blue Economy; on the other hand, it maps competences, research interests, and collaboration potential of young researchers. This approach supports sustainable matchmaking, increases the relevance of mentoring sessions, and strengthens long-term cooperation potential by transforming qualitative and quantitative inputs into operational elements, including support for pilot project development.

To ensure effective matching and a clear definition of roles, DIH Innovamare developed separate invitations and tailored questionnaire paths for companies involved in mentoring and for young researchers. Dissemination took place through multiple channels, including project social media, the website, the Map of Excellence, and direct contacts through the partnership in Croatia and Italy. This multi-channel approach enabled broad participation, cross-border representativeness, and validation of the questionnaire across different Blue Economy sectors.

This demand-oriented approach ensures that industry–research interactions are targeted, goal-oriented, and capable of generating concrete outcomes, overcoming traditional models of unstructured networking. The survey was administered to young researchers and industry representatives both online and in person, during events organised in Lecce (Italy) from 20 to 22 May 2025 and in Zadar (Croatia) from 3 to 5 December 2025.

3. Empirical evidence supporting the methodology

Although not yet fully implemented, the pilot model is grounded in preliminary evidence emerging from analysis of survey results. The observed alignment between industrial needs and research competences provides initial validation of the logical coherence of the proposed model.

This evidence confirms the relevance of a structured approach based on needs identification, facilitated matching, and mentoring, which constitute the core elements of the pilot workflow. These results justify the design choices underlying the model and support its further operational development.

Analysis of collected responses shows that an approach based on structured needs assessment, targeted matching, and mentoring is an effective tool for activating concrete, innovation-oriented interactions. It also highlights that collaboration already exists in the market, although with significant room for improvement.

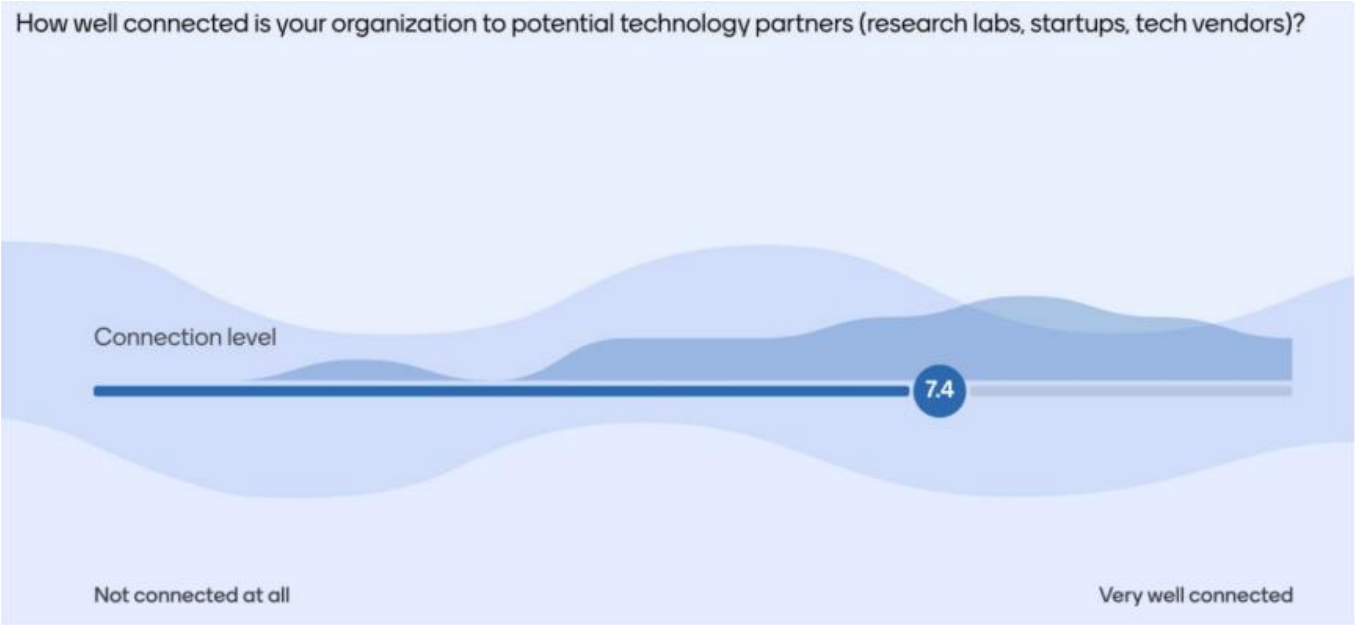

Figure 1 - Example of interaction and question to stakeholders during Brainstorming session in Lecce

From the perspective of young researchers, the survey reveals a high level of motivation and willingness to engage with real industrial challenges and complex application contexts. Respondents express a clear interest in moving beyond a purely academic research dimension, applying knowledge, methods, and technologies to concrete problems in the marine and coastal sectors. In particular, there is a strong inclination to acquire transversal skills related to innovation management, technology transfer, valorisation of research results, and access to national and European funding opportunities.

Declared competences of young researchers cover a wide thematic and disciplinary spectrum, fully aligned with the strategic priorities of DIH Innovamare and the challenges of the Blue Economy. Highly represented areas include maritime safety, offshore renewable energy, environmental and oceanographic monitoring, sustainable aquaculture, and digital and data-driven technologies, including AI-based solutions, advanced sensing, and GIS systems. This diversity confirms the existence of an interdisciplinary competence base well suited to addressing complex and systemic industrial needs.

From the perspective of companies and industrial stakeholders, the survey highlights clear, recurring, and well-defined needs, mainly related to technological innovation, process digitalisation, and environmental sustainability. Companies report the need to adopt new technologies to improve operational efficiency, reduce environmental impact, optimise data management, and strengthen competitiveness. In this context, mentoring is recognised as a key tool to introduce real operational challenges into the collaboration process, facilitate dialogue with the research community, and identify reliable scientific partners for structured cooperation. Companies also see research centres as key partners for technology development, while private-sector partners are considered more suitable for market expansion.

Figure 2 - - Example of interaction and question to stakeholders during Brainstorming session in Lecce

A particularly relevant element emerging from the results is companies' willingness to invest in medium- to long-term relationships, moving beyond episodic collaboration. Companies recognise the value of pathways that can evolve towards joint applied research projects, experimental development, and participation in funding programmes, thus contributing to the construction of a stable, results-oriented innovation ecosystem.

Joint analysis of responses from young researchers and companies shows a high level of alignment between industrial needs and research competences, with numerous areas of thematic overlap. This confirms the effectiveness of the survey-based matching process and fully justifies adoption of a structured mentoring model in which interactions are prepared, focused, and supported by preliminary analysis and selection activities.

Survey results also indicate that the marine sector is not only interested in, but well positioned to adopt and integrate digital innovation. Stakeholders show strong openness towards emerging technologies and towards development of practical solutions directly addressing real challenges, particularly those related to environmental sustainability, process efficiency, and competitiveness. This openness is accompanied by growing awareness that effective innovation must be supported by appropriate organisational models and structured ecosystems.

This readiness is further reinforced by recognition of the importance of collaborative frameworks and well-organised support systems, such as those offered by DIH Innovamare, capable of accompanying companies and researchers not only in ideation, but also in implementation, validation, and scaling of developed solutions. In this sense, evidence from the survey confirms that a model based on surveys, mentoring, and technology brokerage represents a concrete and effective response to the innovation needs of the Blue Economy.

4. The DIH Innovamare model and its role

DIH Innovamare operates as a transnational Digital Innovation Hub, structured as a non-profit organisation and based on a multi-stakeholder governance model. It integrates companies, research organisations, public institutions, and innovation intermediaries within an extended and shared ecosystem in which civil society and territories also play an active role. In this sense, the DIH intervention model is fully coherent with the Quadruple Helix approach, which complements traditional innovation actors with a fourth dimension represented by society, end users, and territorial stakeholders.

The operational model of DIH Innovamare builds on both the results achieved in the previous Interreg ITA–HR Innovamare project and the outputs of activities carried out within the DIH Innovamare project (Deliverables D.2.2.1 and D.2.2.2).

Within this framework, DIH Innovamare acts as a systemic intermediary, capable of linking scientific competences and industrial challenges with social, environmental, and territorial needs related to Blue Economy development. DIH Innovamare provides an integrated service portfolio including ecosystem building and animation, technology brokerage, test-before-invest services, skills development and training through the Innovamare Academy, and support for access to finance and development of national and European projects.

The pilot model is structured as a progressive and iterative process including needs and competence mapping, thematic analysis and clustering, facilitated matching, mentoring activities, and definition of potential collaboration pathways. This approach accompanies companies and researchers along a structured pathway, reducing the gap between innovation demand and supply.

The main objective of the model is to reduce the cultural, temporal, and operational distance traditionally separating industry and research, creating stable conditions for effective exchange of knowledge, resources, and project ideas.

The starting point of the model is the definition of a shared vision, in which industry and research recognise a common interest in developing high value-added innovative solutions. This vision is translated into clear and measurable objectives, such as acceleration of technology transfer processes, increased company competitiveness, valorisation of applied research results, and development of hybrid skills capable of operating at the interface between science and industry.

Operationally, the model is articulated around three main dimensions: communication, collaboration, and transfer.

Pillar	Objective	Tools
Communication	Create continuous dialogue	Thematic tables, workshops, matchmaking

	channels on needs and skills	portals between companies and research groups
Collaboration	Launch joint projects	Co-funding calls, research contracts, industrial PhDs
Transfer	Apply and disseminate results	Patents, spin-offs, proof-of-concept, living labs

The communication dimension is essential to overcome information asymmetry between the two domains. It involves creation of structured and continuous dialogue channels, such as sectoral thematic tables, joint workshops, matchmaking platforms, and periodic exchanges aimed at defining shared technological priorities. A key role is played by intermediary figures, often referred to as knowledge brokers, who facilitate translation of industrial problems into research questions and, conversely, of scientific results into applicable solutions.

The second dimension, collaboration, concerns activation of joint projects based on a co-creation approach. The model promotes instruments such as collaborative research contracts, industrial PhDs, co-funded research fellowships, joint laboratories, and open innovation initiatives. These modalities actively involve researchers and companies throughout the innovation cycle, from problem definition to solution testing, reducing development time and increasing industrial impact probability.

The third dimension, transfer, represents consolidation of the model. It focuses on valorisation of research results through technology transfer tools such as intellectual property protection, development of proof-of-concepts, creation of spin-offs and deep-tech start-ups, and use of living labs and test-beds for validation in real contexts. In this phase, involvement of companies as end users of developed technologies is essential to ensure effective adoption and sustainability of innovations.

Overall, the model aims to transform the industry–research relationship from episodic and opportunistic to systemic and continuous, fostering stable collaboration networks and contributing to development of a more integrated, dynamic, and competitive innovation system.

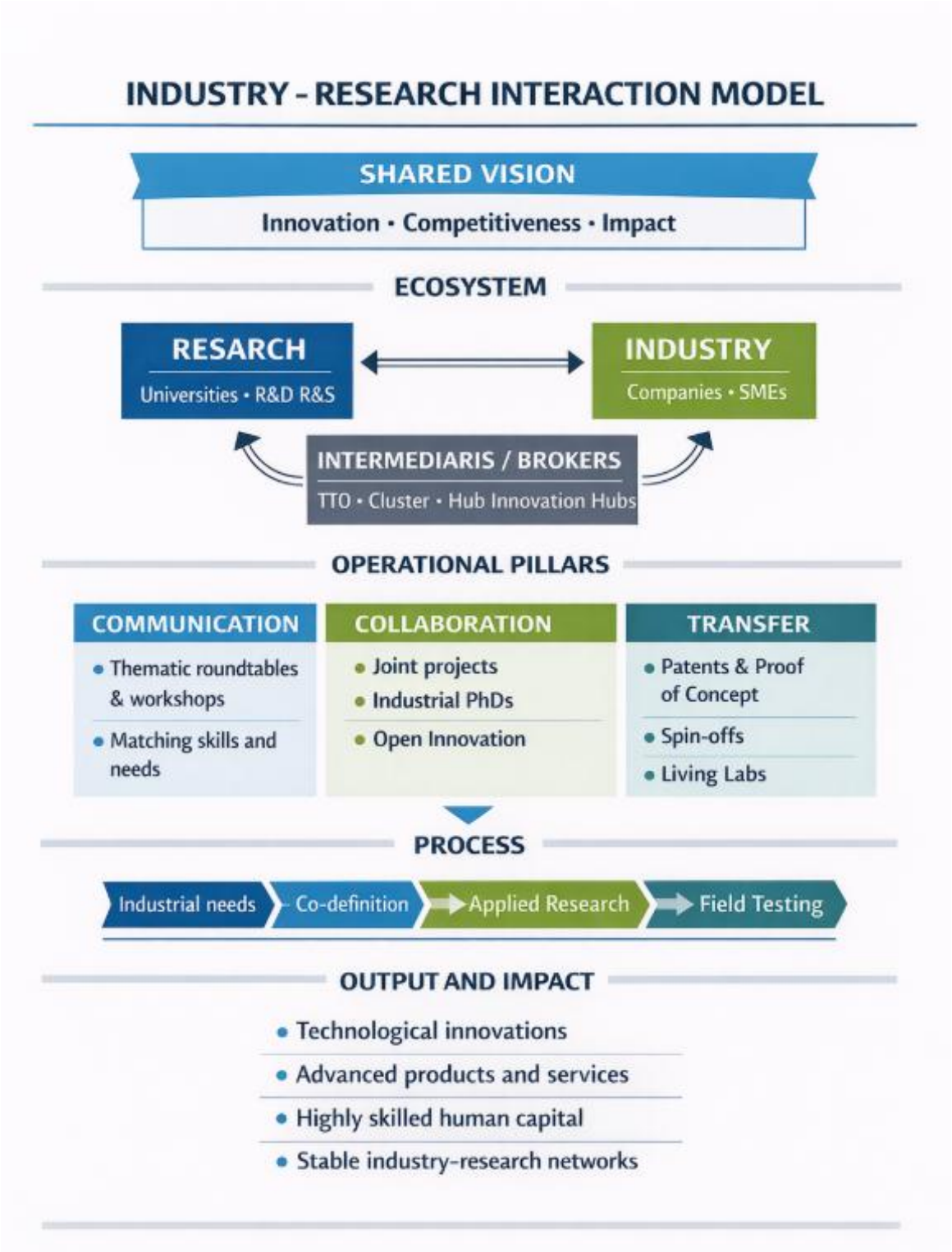

Figure 3 - Scheme of Industry - Research Interaction Model

5. How the pilot model will be offered as a DIH Innovamare service

The pilot model is conceived as a dedicated DIH Innovamare service to foster structured industry–research collaboration in the Blue Economy. During the pilot phase, the service will be offered in a facilitated and experimental mode, enabling testing of interaction formats and support modalities.

The service will target SMEs, start-ups, and other industrial stakeholders, as well as young researchers and research groups interested in applied collaborations. Access will be mediated by DIH Innovamare, ensuring alignment with strategic and thematic priorities.
From an operational perspective, the pilot service will feature a structured entry point based on needs assessment, brokerage and mentoring activities, and flexible interaction formats adapted to the maturity level of involved actors. The process workflow is described in Fig. 4.

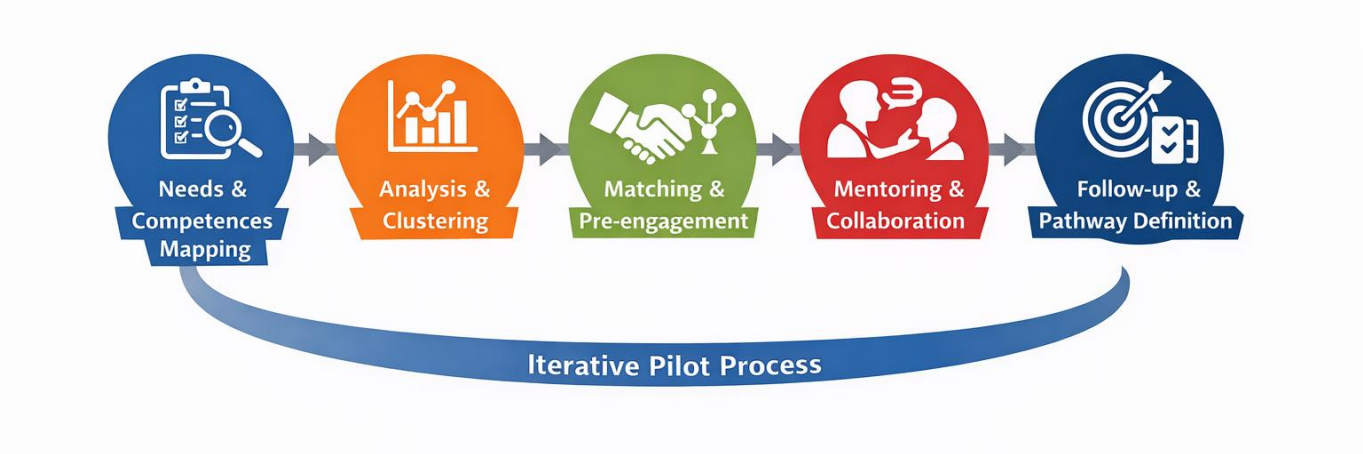

Figure 4 - Focus of the communication workflow of the interaction model

5.1 Positioning of the service within the DIH Innovamare portfolio

The pilot industry–research collaboration model is positioned as a cross-cutting service within the DIH Innovamare portfolio, combining elements of innovation brokerage, skills and mentoring, and technology transfer. Its core function is to connect real company needs with the expertise of young researchers through a structured mentoring and matching process.

Within the DIH Innovamare ecosystem, the service acts as a bridge between demand and supply of innovation, translating industrial challenges identified through the company survey into concrete collaboration opportunities with the research community. In this sense, it complements existing DIH services related to ecosystem building, competence development, and support for innovation projects.

The service is not conceived as a standalone initiative, but as an integrated component of the DIH Innovamare service architecture. It is designed to interact with other DIH services, such as the Innovamare Academy, technology brokerage activities, and support for access to funding, ensuring continuity from needs identification to potential project development and implementation.

This positioning enables the pilot model to contribute to the overall mission of DIH Innovamare by strengthening structured industry–research collaboration, enhancing the role of young researchers in innovation processes, and supporting companies in addressing complex technological and sustainability challenges in the Blue Economy.

5.2 Target groups and access criteria

The pilot model primarily targets companies operating in the Blue Economy, with a particular focus on SMEs, as well as young researchers and research groups whose expertise is relevant to identified industrial challenges. Companies represent the demand side of innovation, while young researchers provide the supply of scientific and technological competences.

Access to the service will be organised through a structured and selective process, combining targeted invitations and periodic calls coordinated by DIH Innovamare. The selection of companies will be informed by the results of the survey conducted on 30 enterprises, ensuring that mentoring activities are based on real and clearly defined industrial needs.

Eligibility criteria will include relevance to Blue Economy sectors, demonstrated interest in collaborative innovation, availability to participate in mentoring activities, and alignment with the strategic priorities of DIH Innovamare. Young researchers will be selected based on their expertise, research interests, and potential to contribute to applied innovation processes.

This approach ensures a balanced and demand-driven participation of both industry and research actors, maximising the effectiveness and impact of the mentoring model.

5.3 Operational delivery modalities

The service will be delivered through a structured mentoring process, based on systematic identification of company needs and matching with young researchers' competences. Mentoring activities will be organised in thematic cycles, supported by flexible interaction formats adapted to the capabilities of mentors and the specific challenges faced by companies.

Industry mentors, coming from participating companies, will play a central role in the model by bringing practical knowledge, real operational challenges, and market-oriented perspectives into the mentoring process. Their contribution will facilitate meaningful interaction with young researchers and support the

development of concrete collaboration opportunities.

The typical duration of a mentoring pathway is expected to range from 2 to 6 months, depending on the complexity of the identified challenges and the level of engagement of participants. The process will be structured around key phases, including needs assessment, matchmaking, mentoring sessions, and definition of potential collaboration pathways.

Expected outputs of each pathway include the identification of specific industrial challenges, formulation of preliminary project ideas, development of cooperation roadmaps between companies and young researchers, and exploration of opportunities for further collaboration and access to funding.

This operational framework ensures that mentoring activities are not isolated events but part of a coherent and progressive innovation process, capable of generating tangible and sustainable outcomes.

5.4 Sustainability model and post-project perspectives

The sustainability of the pilot model is ensured by its demand-driven nature, as it is based on real company needs on one side and the continuous availability of young researchers' expertise on the other. This dual structure creates a stable foundation for long-term industry–research collaboration and justifies the integration of the model into the DIH Innovamare service portfolio.

During the pilot phase, the service will be offered in a facilitated and experimental mode, without direct costs for participants, to encourage broad engagement of companies and young researchers. In the post-project phase, the model is expected to gradually evolve towards a co-funded or hybrid financing scheme, depending on the level of service complexity and the value generated for participating companies.

A potential cost-sharing mechanism between DIH Innovamare and companies may be introduced for advanced mentoring, technology brokerage, and project development activities. This approach will contribute to financial sustainability while maintaining accessibility for SMEs.

In the long term, DIH Innovamare will allocate dedicated organisational and human resources to maintain and further develop the service. The model will also benefit from synergies with other DIH services, partnerships with research institutions and industry stakeholders, and alignment with national and European funding programmes.

Beyond financial aspects, sustainability is also ensured through the creation of stable collaboration pathways between companies and young researchers. By transforming episodic interactions into structured and continuous cooperation, the model contributes to strengthening the innovation ecosystem in the Blue Economy and ensures its relevance beyond the project lifetime.

6. Conclusions

The industry–research collaboration model developed within the DIH Innovamare framework represents a structured, coherent, and operational response to the innovation needs characterising the Blue Economy. Based on a demand-driven approach, supported by robust methodological tools such as the survey, and articulated through a structured mentoring process, the model demonstrates how effective and results-oriented interactions between the productive system and the research community can be facilitated.

Evidence emerging from survey analysis confirms the validity of the methodological framework and highlights a high level of alignment between company needs and young researchers' competences. This alignment is a fundamental prerequisite for building stable and valuable collaborations capable of evolving towards applied research projects, experimental development, and joint initiatives at national and European level.

The model is developed within a transnational context involving Italian and Croatian actors, reflecting the cross-border nature of DIH Innovamare. This dimension enables experimentation with collaboration mechanisms that leverage complementarities between innovation ecosystems, research competences, and industrial needs, strengthening the added value of the project approach.

Model sustainability is supported by its strong alignment with real market demand and its integration into the DIH Innovamare service portfolio. The systematic linkage between company needs and research competences generates continuous value for both sides and creates conditions for progressive structuring of the model as a stable DIH service.

As a pilot model under development, the approach presents some limitations, particularly related to the lack of full large-scale validation. Future phases will focus on operational testing, structured feedback collection from involved stakeholders, and progressive refinement, with the objective of consolidating effectiveness and sustainability in the medium to long term.

The proposed methodology is replicable across different thematic domains and territorial contexts, making the model scalable within the DIH Innovamare ecosystem and transferable to other settings. Overall, the model provides a solid and functional methodological framework to support innovation processes in the Blue Economy, positioning itself as a reliable reference for future initiatives, funding programmes, and innovation policies oriented towards structured, interdisciplinary, and high-impact collaboration between industry and the research system.