WP5 – Deliverable 5.5.3
1 Cross-border collaborative network model for the management of innovation in F&A

Deliverable Number D5.5.3

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Contribution by	
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INVESTINFISH PROJECT

INVESTINFISH - “Boosting INVESTments in INnovation of SMEs along the entire FISHery and aquaculture value chain” is a project funded by the Italy – Croatia CBC Programme under the Priority Axis 1 “Blue Innovation”, Specific Objective 1.1 (S.O.1.1) “Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area”.

INVESTINFISH sees the cooperation of n. 6 Partners from 5 Different Regions: T2I (LP – Italy – Veneto), Sviluppo Marche (PP1 – Italy – Marche), D.A.Re. Puglia (PP2 – Italy – Puglia), Punto Confindustria (PP3 – Italy – Veneto), Istrian Development Agency (PP4 – Croatia – Istria), Zadar County Rural Development Agency (PP5 – Croatia – Zadar).

INVESTINFISH main objective is strengthening of competitiveness of F&A production system through promotion of investment programs aimed at acquisition of innovation services. INVESTINFISH implements pilot actions providing some IT-HR F&A SMEs with a roadmap to innovation instruments & services, boosting creation of marketable innovative products and/or processes that will improve the SMEs potential market positioning.

Expected benefits for enterprises are: accelerate time to market, increase linkages with innovators, increase F&A enterprises R&D expenditures in new & greener components/technologies/services, to boost HR-IT competitiveness. INVESTINFISH intends also to offer to the F&A sector to substitute the value chain concept with value network, proposing a shift from traditional value chains towards more collaborative value networks.

THE CONTEXT

Innovation takes place increasingly in cross-border collaborative networks, which are shaped by the characteristics of systemic innovation, the strategies and objectives of the main actors, and the dynamics of the innovation process.

Participation in such networks is of great importance to small businesses **but requires long-term investment** and a wide range of collaboration and innovation capabilities. This deliverable explores how innovation projects such as INVESTINFISH based on open, user-centric innovation methodologies, can support the creation of collaborative networks to support small businesses and other actors to engage in cross-border collaboration and to accelerate the development and acceptance of innovations, based on the lessons learned thanks to the project pilot actions.

Fishing is a millenary activity. Man has always sought sustenance even from the sea. Over time technologies have evolved, and fishing systems have become more sophisticated, as the habits and behaviours of the various species present and available at sea are understood. Fishing gear has changed over time becoming more and more suitable for catching the most popular species. This evolution is still ongoing; technological development never stops.

In recent times, however, there has been a **greater sensitivity towards environmental problems** and, in the development of new fishing methods, their impact on resources and the environment is considered. For this same reason, **fisheries regulation has become more stringent and specific**. Each fishing gear has its own regulation that establishes its construction limits, the characteristics of its armament, the areas and times in which it can be used.

The times of technological development without limits, and without taking into account environmental problems, has passed and now there is a strong sensitivity, both on the part of fishermen and on the part of administrations, aimed at making sustainable interventions and using fishing systems and technology with acceptable impact, thereby making fishing more responsible. **These considerations are examples of the major social challenges of today**; they are also examples of changes in complex systems.

Addressing these challenges requires not only the adoption of technological innovations, but a broader consideration of the broader context of open and systemic innovation (Maula et al.,

2006). Systemic innovation includes related technological, organizational, financial, legal, and institutional adaptations, as well as changes in human behaviour and practices.

Change and innovation in complex systems can be very difficult to achieve and takes time due to the many actors and interests involved (Herzlinger, 2006; Moss Kanter, 2011), their interactions and dependencies within such systems, and consequently the difficulty in identifying the causes and predicting the impacts of the interventions. Therefore, it is important to understand the characteristics of complex systems as well as the systemic nature of the required interventions that lead to innovation and change. as well as changes in human behaviour and practices.

INNOVATION

A very clear output of the pilots carried on in INVESTINFISH is that F&A SMEs look for solution that have a (relatively high TRL).

TRL	Description
1	Basic principles observed
2	Technology concept formulated
3	Experimental proof of concept
4	Technology validated in lab
5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
7	System prototype demonstration in operational environment
8	System complete and qualified
9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

This means that the support should focus on **innovation** instead of **research.**

Research and development is defined in the **Frascati Manual** as "*the creative and systematic work undertaken to increase the stock of knowledge (including knowledge of humanity, culture and society) and to devise new applications of available knowledge*".

On the other side **innovation** is defined in the **Oslo Manual**:

"a innovation is a new or improved product or process (or combination thereof) that differs significantly from the company's previous products or processes and has been made available to potential users (product) or put into use by the company (process)"

The difference is relevant since the support process should focus on **finding an existing applicable solution,** more than on **developing new ones.** Moreover, several funding calls focus on research, and this means that they may not fully address the needs of F&A small companies.

NETWORK FUNCTIONS

Literature identifies several functions that need to be provided for the innovation to be effective. These functions can be covered by the innovating company itself, or by the "innovation provider". However, several functions remain uncovered or are covered only in part by the company and the provider (especially in case of SMEs), and therefore represent needs that a collaborative network model for the management of innovation in F&A should address. The functions are presented in the table below.

Symbol used in the table	Meaning
■	Function mostly covered
□	Function partially covered
●	Service to be addressed by the network

Function	Covered by SME	Covered by provider	To be addressed by network	Comments
1. Foresight and diagnostics				
Technology foresight and forecasting		☐	●	Innovation providers can provide insight about technology evolution, but their representation may be biased
Articulation of needs and requirements	☐		●	SMEs may have difficulties to translate their business needs into technological requirements. Innovation maturity assessment services may help.
2. Scanning and information processing				
Information gathering and identification of potential collaborative partners	☐			SMEs may need help to identify and collect information about potential partners.
Selection of collaborative partners	■			
3. Knowledge processing, generation and combination				
Helping to combine knowledge of two or more partners			●	In case of projects that involve several actors, there is usually the need to support the management of the project.
As above, but also generating in-house research and technical knowledge to combine with partner knowledge	☐	☐		
4. Gatekeeping and brokering				
Matchmaking and brokering	☐	■		Unexperienced SMEs may need help to negotiate the terms of an innovation project.
Contractual advice			●	SMEs often may need a third-party support especially on IPR aspects of the innovation project
5. Testing, validation, and training				
Testing, diagnostics, analysis and inspection		■		

Prototyping and pilot facilities		■		
Validation			●	Validation, to be reliable, is a service that needs to be offered by a third party
Training		☐	●	Two main needs need to be addressed: - Joint training in use of new technologies - Managerial skills to plan and evaluate the benefits of new technologies. This is a key activity that is not currently considered by most innovation-focused services but emerged as a criticality in INVESTINFISH pilots.
6. Accreditation and standards				
Specification setter or providing standards advice			●	Representative of the cross-border network should take part to relevant standardisation body working group, to act as a liaison with F&A companies (first-hand information on future standards; lobbying for standards that meet F&A SMEs' needs).
Formal standards setting and verification	☐	☐		
Voluntary and de facto standards setter	☐	☐		
7. Regulation and arbitration				
Regulation			●	The cross-border network should interact constantly with policymakers
Self-regulation	☐	☐		
Informal regulation and arbitration	☐	☐		
8. Intellectual property: protecting the results				
Intellectual property (IP) rights advice	☐		●	The cross-border network should include also experts on IPR (in INVESTINFISH case, t2i is one of the major PATLIB nodes in north-east Italy)
9. Commercialisation: exploiting the outcomes				
Marketing, support and planning	■			
Sales network and selling	■			
Finding potential capital funding and organising funding or offerings	☐			

10. Assessment and evaluation				
Technology assessment (General assessment of performance and technologies)		☐	●	A third-party, independent, evaluation may be appreciated
Technology evaluation (Specific evaluation of products and technologies once in the market)	☐		●	A third-party, independent, evaluation may be appreciated

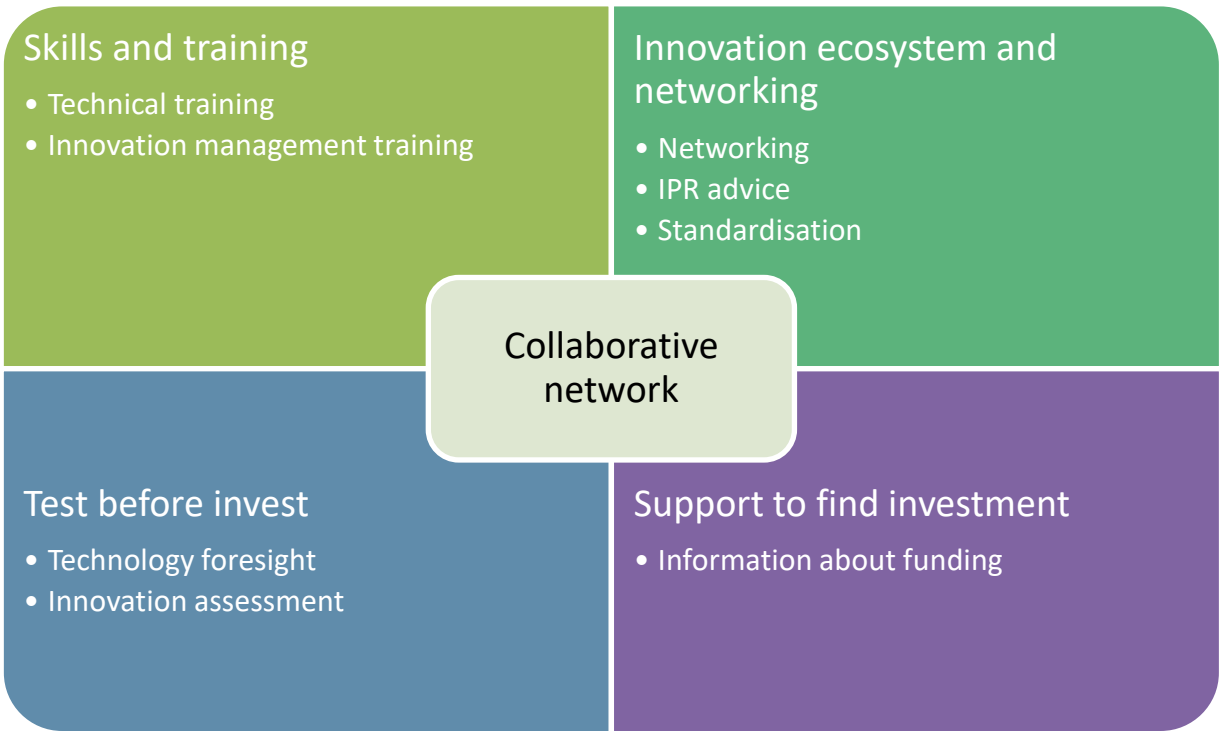
Summarising, the cross-border network should be able to provide the following services:

Technology foresight	Provide an overview of (future) new technologies that can impact the F&A sector.
Innovation assessment	Help SMEs articulate their needs
Support to collaborative project	Validate the project idea and provide project management services
Networking	Support to find potential (technical and research) partners
IPR advice	Provide advice on potential IPR issues related to innovation and collaborative projects
Training	- Training on technologies - Training on innovation management
Standardisation	Taking part in relevant standardisation working groups
Validation	Provide third-party validation of technologies
Information about funding	Provide information on local / EU funding relevant for the F&A Sector

These services should be grouped following the framework designed at EU level for **the Digital Innovation Hubs.** This has two benefits:

- Organises the services in a framework that is becoming familiar for SMEs, therefore making easier to understand and access the services.
- Allow “network nodes” to use an approach that is consistent services provided to other sectors (especially for actors that are DIH / part of a DIH).

A possible grouping is presented in the figure below.



MEMBERS OF THE COLLABORATIVE NETWORK

The collaborative network has its roots in the INVESTINFISH partners, but it is meant to include further subjects. In particular, the Poles of Excellence identified in D3.1.1 are meant to be engaged in the collaborative network activities.

The poles of excellence includes several types of organisations, presented in the figure below.

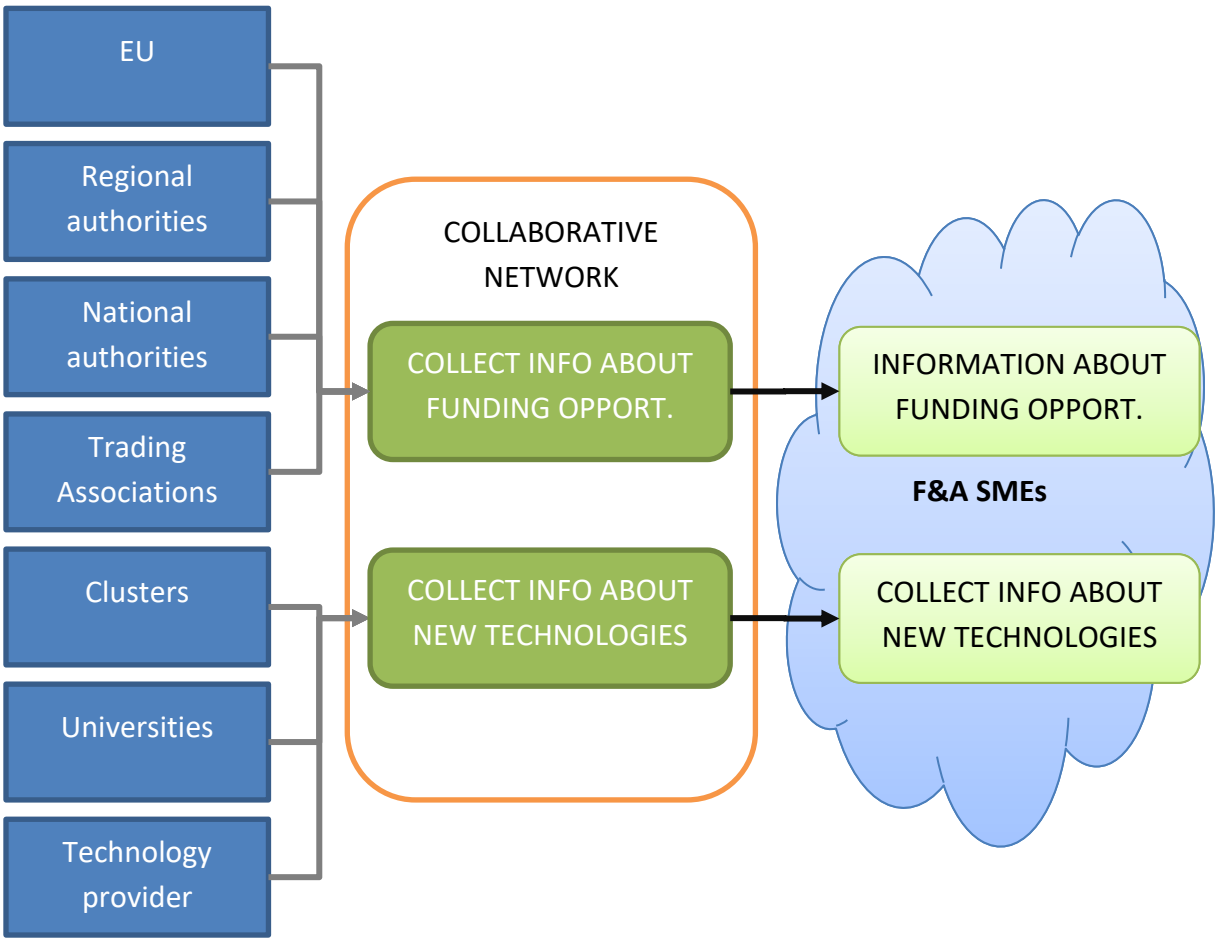
- Universities
- Technology transfer institutions
- Research institutions
- Centers of excellence
- Clusters
- Digital Innovation Hub
- Competence Centres
- Scientific Parks
- Incubators/Accelerators
- Business Support Organization

NETWORK MODEL

The collaborative network should provide two types of services:

- **PUSH services**: the network initiate the activities toward the F&A SMEs
- **PULL services**: the activity is initiated by a F&A SME request

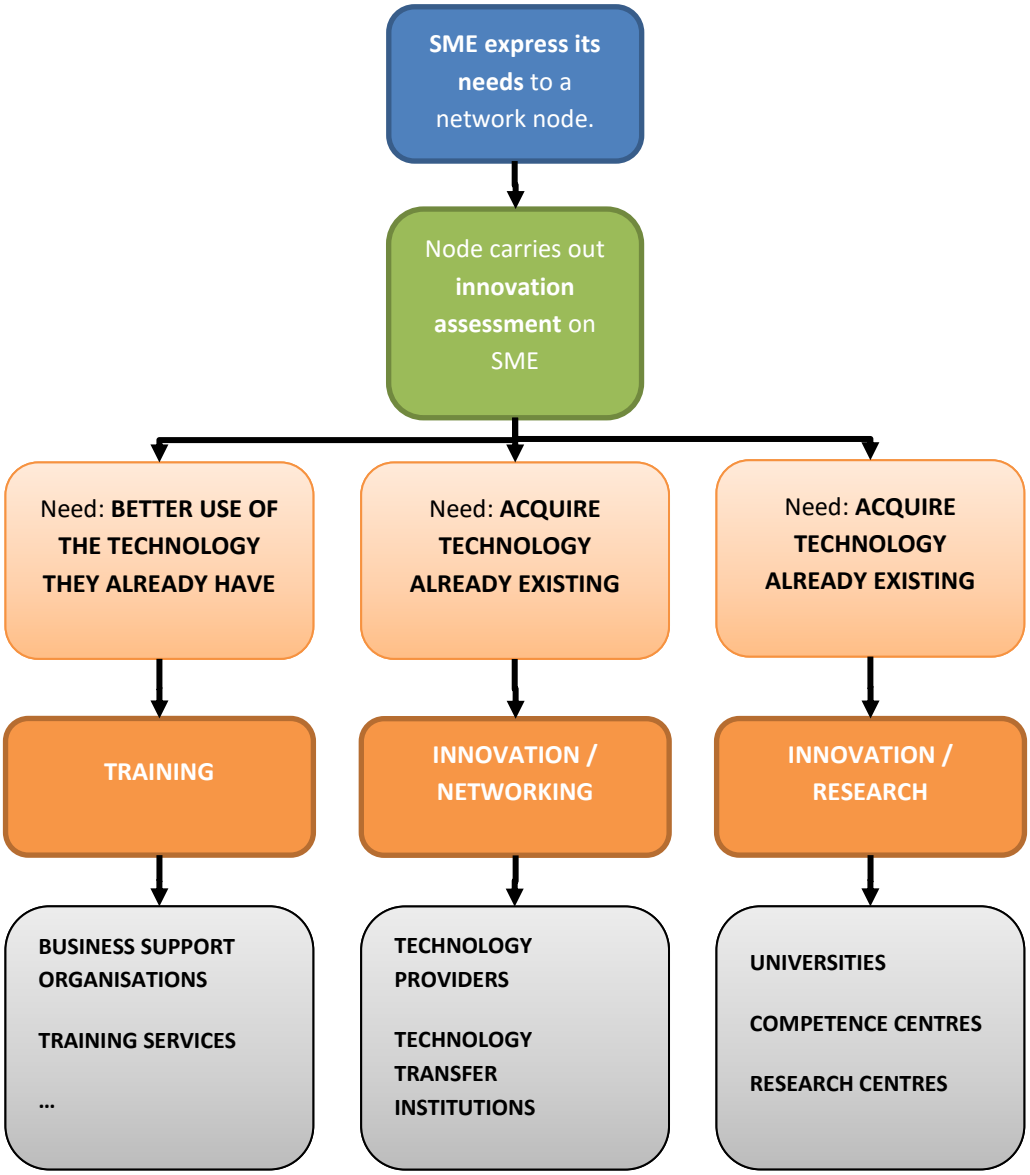
The following scheme present the workflow for PUSH services, that are mostly focused on informing SMEs about relevant technologies and funding opportunities.



PUSH services aim at creating awareness, to create the pre-conditions to encourage innovation in the F&A sector.

On the other side, PULL services are meant to directly assist F&A SMEs in managing innovation. The process includes some "decision steps" (e.g., innovation assessment): it would be ideal that the methodologies to take these decisions are common throughout the network. However, this is not realistic (at least in the short term) due to internal procedures and the fact that many organizations already have specific methodologies that they are required to adopt at this end. It is important however that the adopted methodologies, even though different, are recognized

and validated (possibly combined according to SME's needs): e.g., CAS methodology to evaluate the "circular economy level", SELFIE4.0/ZOOM4.0 to evaluate Digital Maturity. The "network node" (i.e., an organization member of the collaborative network) should manage the request by a F&A SME as following.



The general approach is that each node of the network should act as a “doorway” for F&A SMEs and should be able to provide at least basic “triage” of the company’s needs. After this, it should forward the company to the most suitable node (INVESTINFISH partner or pole of excellence) that may be able to satisfy its need.

The local node should however keep monitoring the progress of the company: this is important to maintain a relationship with it and to make them “feel followed” and avoid the risk that the company may feel bounced around the network. Additionally, the local node help is usually needed when the organizations to which the SME is directed is located in another area, thus supporting trans-national collaboration.