



D.T 3.2.1

Joint roadmap to enhance local and transnational innovation management services

ARR SA BIELSKO-BIALA

Version Final





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Joint Roadmap to enhance local & transnational innovation management services in PF

The aim of the measure is to activate the preparation of recommendations for activities aimed at designing a management system supporting the flow of knowledge and information exchange between the agricultural production sector, R&D and education sector, industrial production sector and financial sector.

Reaching for the definition of innovation (lat. innovation, meaning renewal), it should be explained as a sequence of activities leading to the creation or improvement of new products, technological processes or organizational systems. No matter what type of innovation we are dealing with, its creation is always the result of one of two components. The first is research and development work, conducted at universities and research institutes, while the second is the demand for new, improved technologies.

The digital transformation of the economy is key for Europe to remain competitive internationally. Our companies and public sector organisations need to integrate digital technologies into their business processes, products, and services to fully benefit from the efficiency gains and innovation they may bring, like environmental sustainability and reduce greenhouse gas emissions.

In the agriculture sector, integration of digital technologies drives towards a new farming model, the so-called Digital and Precision Farming. The adoption of a new model requires the implementation of innovation management services, that should be consistent with the general model of the European Digital Innovation Hubs (EDIH) that will play a central role in stimulating the broad uptake of Artificial Intelligence, IoT, Robotics, as well as other digital technologies in all industries.

The goal is to support organisations to make farming businesses more competitive by speeding up the development and uptake of these new technologies. The services should be close to the end-users (“at working distance”) and thereby cater to the needs of agricultural producers and food processors in a specific region. Structurally, innovation management services should maintain working relationships with several different actors to form a “one-stop-shop” where companies (especially SMEs, startups and mid-caps) can get access to technology-testing, financing advice, market intelligence and networking opportunities”. One or more Competence Centres inside or outside the region provide the knowledge, technology, infrastructure, and facilities that underpin of the technological transformation.

At the same time, it should be emphasized that the occurrence of innovations is not a one-time or one-phase thing. One cannot speak about the introduction of innovation in the context of an invention. Innovation it is not an invention. An invention may be a component of an innovation, as its very creation (unveiling), contributes to launching the entire innovation process.



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Taking this as an example, the most well-known model of the innovation process, which is the linear model, the following stages can be distinguished in it:

- Basic research - relating to theoretical considerations that aim to create new ideas.
- Applied research - relating to find practical solutions to the created projects.
- Development - leading to the creation of a prototype.
- Implementation - which is one of the most important elements of the innovation process, because at this stage there is a kind of confrontation between theory and practice.
- Production - the essence of this stage is the beginning of production.
- Sales - as in the case of production, its initiation is important.

However, as emphasized in the flow-chart below, everything starts from an idea of innovation that usually is motivated by the needing of change to optimize a process or solve a problem. New ideas usually are supported by the advancement of knowledge created by the technology and the developmental growth. Once an idea is conceived, it has to be validated by experts or by future customers in order to understand its future potential application. If the idea is great, then a Research and Development activity occurs in order to translate some theory into a tangible and touchable tool or technology, like a first prototype of the innovation proposed (it can be also in a digital form). Generally, this activity can be performed by private entities, like inventors, companies or start-up, but also public institutions can play a role on it, like universities, research centers or Fab Labs.

The successive realization of a working prototype is the key factor necessary to attract potential investors or business angels that can scale the innovation into a commercial product through the conceptualization of business model that can ensure an economic sustainability of the entire project. In this part, generally, private equities or crowdfunding initiatives are the most common ways to get fundings, but also if the topic of innovation is of public interests policy programs or single/union of countries with dedicated funds can contribute in the scaling of the solution, like in case of EU funds.

After that, the commercialization of the innovation is the key point where the effective impact can occur thanks to the possibility to spread of it among the stakeholders or between common users which are, in case of farming, the farmers.

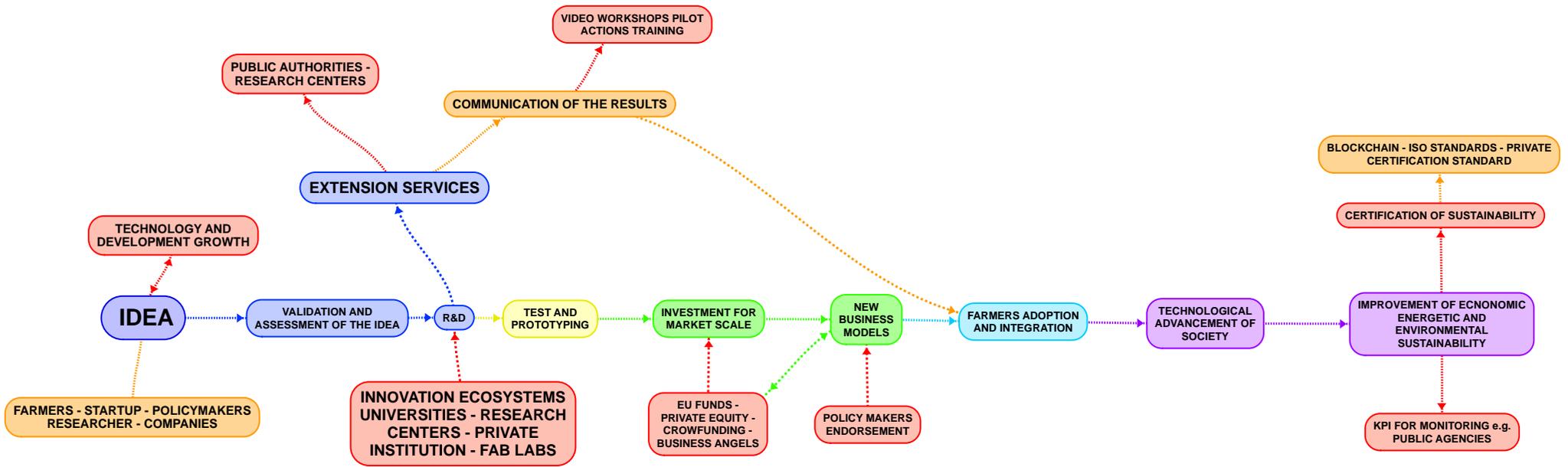
The commercialization and the investments in the innovation can be favored by impacting marketing campaigns (generally made by the organisation owner of the innovation) also with the help of extension services (generally research centres) that can make pioneer experimental trials of the technology, acquire data and then explain the results directly to the stakeholder in order to help them in the decision for the technology adoption.

However, this step is of fundamental importance because is the one that more markedly can generate the positive impacts expected by the initial idea, with, as consequence the realization of the positive social, energy and environmental impacts accounted.

As following task, it will be important to monitor the achieving of these results through key performance indicators (KPI) (usually an activity performed by a public entity), and for the technology -adopters could be of interest to certify their innovative production processes in order to highlight the improvement achieved also among their customers or to create a certified add-value to their products.



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Based on this approach, the main services that should be implemented are:

1. **Education, skills development and training**

To ensure the appropriate level of digital skills within the supported organisations in order to make the most of digital innovations technologies, provided services should include advertising, hosting or providing of training, boot-camps, traineeships, as well as supporting the implementation of the short-term Precision Farming training courses and job placements.

2. **Innovation services, ecosystems and networking**

To increase innovation potential, ecosystem building and networking will help companies to be brought into contact with other companies of their value chain, with innovators, or early clients that want to test solutions. Services should be provided to find for interested companies a matching partner elsewhere in Europe. Moreover, we should work closely with the relevant specialised centres or consortia responsible for the different DEP projects and make sure that companies and public administrations can experiment with those technologies and apply them according to their needs.

3. **Test before invest:** To increase understanding of Precision Farming potential, the companies should have access to hands-on demonstration of key technologies. The “test before invest” service is aimed at allowing a company to identify priorities, and make a realistic return on investment scenario that can help them making a better decision, and ensure that they appropriately equipped to make the best of the investment.

The involvement of multiple agents creates added complexity at the transition points as there is rarely a shared view of the interaction and there are inevitable differences in language and understanding as engineers interact with research scientists and researchers interact with management and marketing. This potential problem of misunderstandings can compromise the successful navigation of a transition and the progression of a particular innovation.

4. **Support to find investments:** this category of services may include: access to financial institutions and investors, supporting the use of InvestEU and other relevant financing mechanisms that support the uptake of Precision Farming and related digital technologies.

In the field of agri-food, farmers, farmer associations, food producers, food supply chain actors, solution providers need digital transformation services through a Multi-Actor Approach (MAA) to provide safe, sustainable and quality food, while considering economic, environmental and social aspects and implications of food production and delivery.



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Based on the four-pillars DIH model presented above, the services should be focused as following:

- **Awareness creation**: highly important for farmers to understand why and how new technologies should be implemented and what are their consequences.
- **Innovation scouting & technology transfer**: Identification and mapping of solution providers on one hand and identification of needs and farmers/food producers on the other hand, is one of the most important DIH services.
- **Develop strategies & business models**: Farmers and food producers need to understand how new technologies affect their business models, which technology to deploy and why. How to choose the right technology and what are the economic benefits for the farmer. Moreover, solutions providers (Startups and SMEs) need to develop their own business models when placing new products on the market.
- **Financing & funding**: Farmers, food producers and solution providers (Startups and SMEs) need financial support for digital transformation and deployment/development of innovative digital products and services. The key question is how we can motivate them to adopt new technologies at a faster pace, thus not losing on competitiveness if they fail to do so. DIH is providing access to funding through European projects, cascade funding opportunities, investors and other financial sources.
- **Mentoring & training**: Farmers and food producers need knowledge about digital technologies and how technologies will change their life and work. In order for them to understand the complex world of digital technologies and their benefits, we need to find new ways of providing mentoring and training, which is more and more focused on the “see and feel” type of training.
- **Living lab**: Farmers believe only if they can see it and feel it. The living lab infrastructure brings together successful use cases from all over Europe, showcasing existing technologies implemented in real-life environment, so that interested target groups can get all relevant information about and around those technologies.
- **Cooperation with DIHs & Networks**: Collaboration with DIHs and networks is a key for more efficient deployment of all other services. It is important to have an international overview when considering the transfer of knowledge and technologies, financing/funding opportunities and business development prospects.



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FUNDINGS

Digital Transformation will not only be supported under the **Digital Europe Programme**, but also by others financial realities, such as:

- **Horizon Europe programme**
- **European Regional Development Funds (ERDF)**
- **European agricultural fund for rural development (EARFD)**

Furthermore, there will be dedicated financial instruments in **InvestEU** to support the uptake of advanced digital technologies, including Precision Farming. It will mobilise public and private investment using an EU budget guarantee. There will be dedicated financial instruments to support the digital transformation, and in particular StartUps/ScaleUps. In particular, it is important to overcome a knowledge gap in financial intermediaries and companies: from the side of financial intermediaries, it is difficult to estimate the risks associated with investments in digital technologies, and from the side of companies it is difficult to estimate costs and expected return on investments.

COMMUNICATION STRATEGY

New technologies are changing not only agriculture, but the way to deal with daily life and the commerce in general, so it is necessary to keep up with the times in order to be more competitive in the market and more efficient. The introduction of new technologies or the implementation of the current ones, is not enough. Indeed, it may be important to modify the business models and processes. Moreover, the digital innovation, not only will improve the industries' performances, but also the services offered to the customers. Farmers and all the people involved in the agri-food projects have to consider and keep in mind these opportunities, but it is not easy to explain and make it clear to them. Communication strategies to disseminate the importance of the digitalization in agri-food field can be:

- Realization of short videos that show the real applications of the technologies
- Creation of some training courses for teaching how to use digital instruments
- Organizations of seminars, workshops and focus groups involving all the key stakeholders, from the farmers to the project managers, engineers, business developers.



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1. *What are the communication channels identified by the partner in the region which are used to communicate the needs of the agri sector to the B+R sector, education sector or financial sector. Please provide (if possible) a practice that exists. What are or would be the most efficient communication channels between agri business needs for most innovative technologies and R&D institutions and industry to stimulate the best efficient knowledge flow and cooperation.*

Existing communication channels:

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.....The way to improve or proposition of the channels for the future communication (actions):

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.....

Recourses (organizational, financial, political) needed for the implementation of improvement and foreseen time horizon for that implementation:

.....
.....

2. *Education and skills in the agriculture if the future. Partners will discuss with experts how in their opinion shall educational system be more responsive to the need of the agriculture. Would it be the separate educational system for the agri specialist or existing education system will “produce” specialist for the agriculture of the future in the specialties of the Industry4.0 technologies.*

The state of the art of education system of the specialist that exist now, What are the bottlenecks that limit efficient inflow of talented people into agriculture

.....
.....

How to design the system to assure that the needs of the agri sector for the skilled personnel are met.

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.....Recourses (organizational, financial, political) needed for the implementation of improvement and foreseen time horizon for that implementation:

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3. *Please identify existing innovation transfer channels and provide (if possible) one good practice or implemented methodology that works. Show the structure if any and the intermediaries engaged in the process. Then discuss and answer the question of the possible*



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improvement into the system needed to be introduced in order to efficient facilitation of the process.

The state of the art of the innovation transfer system that exist now, What are the bottlenecks that limit efficient exchange between agri sector needs and technology transfer from the industry and R&D sector

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How to design/improve the system to assure that the needs of the agri sector are met.

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.....Recourses (organizational, financial, political) needed for the implementation of improvement and foreseen time horizon for that implementation:

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Composition of the expert group:

1.
2.
3.
4.