

## **Annex 2: Strategy ‘Smart Sensors 4 Agri-food’**

25/10/19

### **The challenges**

The agri-food industry is taking its first steps towards Industry 4.0. Some larger enterprises with a broad network, connections with research and technology organisations (RTOs) and international affiliations are up-to-date and aware of the most recent technological developments and its opportunities. However, all over Europe, the agri-food industry is typically a small and medium-sized enterprises (SMEs) driven sector. Even ‘large companies’ are, relatively speaking (in comparison with other sectors), quite small.

For the agri-food industry, the creation of an IoT environment and introducing big data management is a huge challenge, and we believe that a down to earth, stepwise approach, starting from the challenges and needs of the agri-food companies is needed. Many agri-food companies don’t have smart sensor systems (sensors, ICT solutions/platforms, robotic solutions controlled by sensors, monitoring, etc.) installed in their production environment and still rely on manually registered data and data interpretation is done by a few personnel members with specific expertise. This specific expertise and knowledge, built up during years on the job, is in many cases not secured in systems or procedures.

Removing these bottlenecks involves the investment in smart sensor systems, ICT solutions as well as in data analysts (to ensure data collection, management and mining) that have an understanding of food-related issues, ranging from food safety, food quality and traceability. It is of paramount importance to extract the relevant information from the available digital data, understand the data, recognize trends and take preventive measures to ensure a smooth-running production process, predictive maintenance of machinery and so on.

The agri-food system becomes more and more interconnected between different stakeholders (farmer, consumer, retailer, food processing industry, etc.). The need for more and improved tracking and tracing, higher quality standards, prevention of food losses and so on, increase the demand for smart sensor systems, data management systems, etc. Multinationals hire consultants to scan their production and to introduce those systems, for agri-food SMEs it is a lot more difficult to find the right solutions.

### **Objectives and overall methodology**

The aim of our Thematic Smart Specialisation Partnership (S3P) is to set-up a platform and supportive business ecosystem between agri-food clusters and clusters representing technology and/or digital solution providers, relevant RTOs and other stakeholders, to lower the barriers for agri-food companies to access and implement the newest smart sensor systems, make them acquainted with and train them in data management and mining, etc. and thus facilitate and enable the Industry 4.0 transition of the agri-food industry.



Making the leap towards Industry 4.0 is the final step of a larger strategy and trajectory involving all aspects linked to the digitalization of the agri-food industry, such as data management, blockchain, artificial intelligence, augmented reality, robotics (cobots), cybersecurity, skills development of workers and management, etc.

The continuous collaboration between the clusters (or innovation actors providing similar services) and RTOs will create a trust zone between the involved sectors, companies and also regions.

Agri-food companies have specific requirements for the sensors, related ICT solutions, etc. and also expect the machine producers to integrate these sensors in their equipment/machines/production lines. By creating this European smart sensor systems agri-food platform, the involved stakeholders will get a better understanding of each other's capabilities/capacities and specific requirements for these technologies.

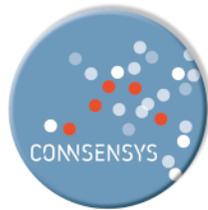
As backbone of our Strategy we will set-up a network of shared, open access living labs, where smart sensor systems, related ICT solutions and other technologies can be demonstrated, tested and where related and relevant training sessions and workshops can be organised. Competition and duplication within EU regions limits the development of critical scale. It is clear that collaboration between complementary EU regions is more effective, efficient and sustainable than competition. Frequent cross-sectoral and interregional meetings and activities, involving all parties of our ecosystem (see below), will be necessary to translate our shared vision into a roadmap, strategic lines and concrete investment projects to accomplish our goals.

These living labs provide a 'safe' environment for agri-food companies to get a first experience with these technologies and digital solutions. We will define and connect already existing, comparable living labs, staffed with competent, multidisciplinary teams, from different European regions. Starting from the specific needs and challenges of the agri-food SMEs, it is our strong believe that the living labs offer the ideal environment to get introduced to new technologies and experience first-hand the potential, opportunities and added value they have in store for specific applications.

Also, the Partnership will make efforts to secure funding for the work and ensure that the objectives of the Partnership are reached. Next to the investments projects, we will engage in other regional and European projects, to further elaborate our Partnership and roll-out our Strategy and Implementation Roadmap. Projects will be set-up in a transparent and non-discriminative way within the Partnership, taking into account the rules and guidelines of the respective programme and call text.

The ecosystem involved is complex and includes multiple actors with different fields of expertise. We see the following relevant stakeholders in the Industry 4.0 value chain for the agri-food industry:

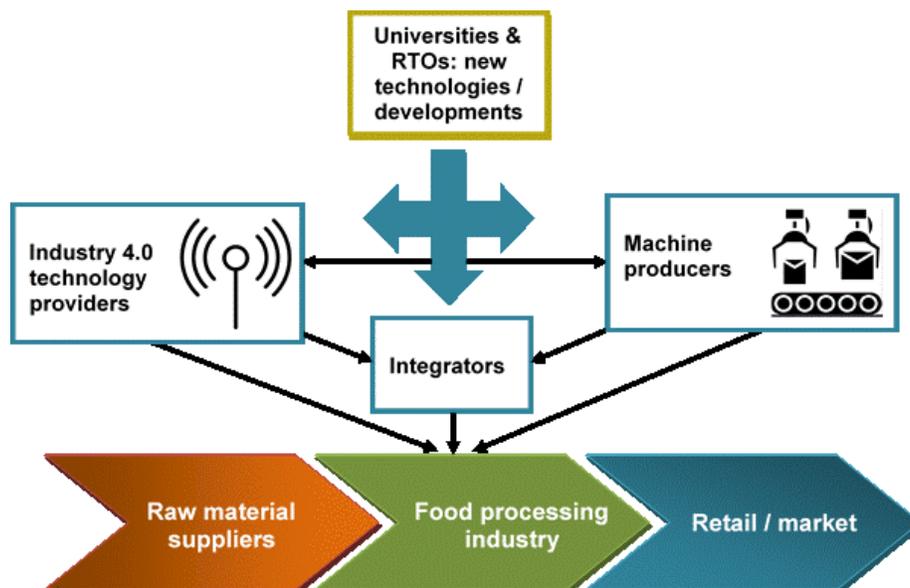
- Agri-food companies
- Technology providers: including smart sensor producers, etc.
- Digital solution providers



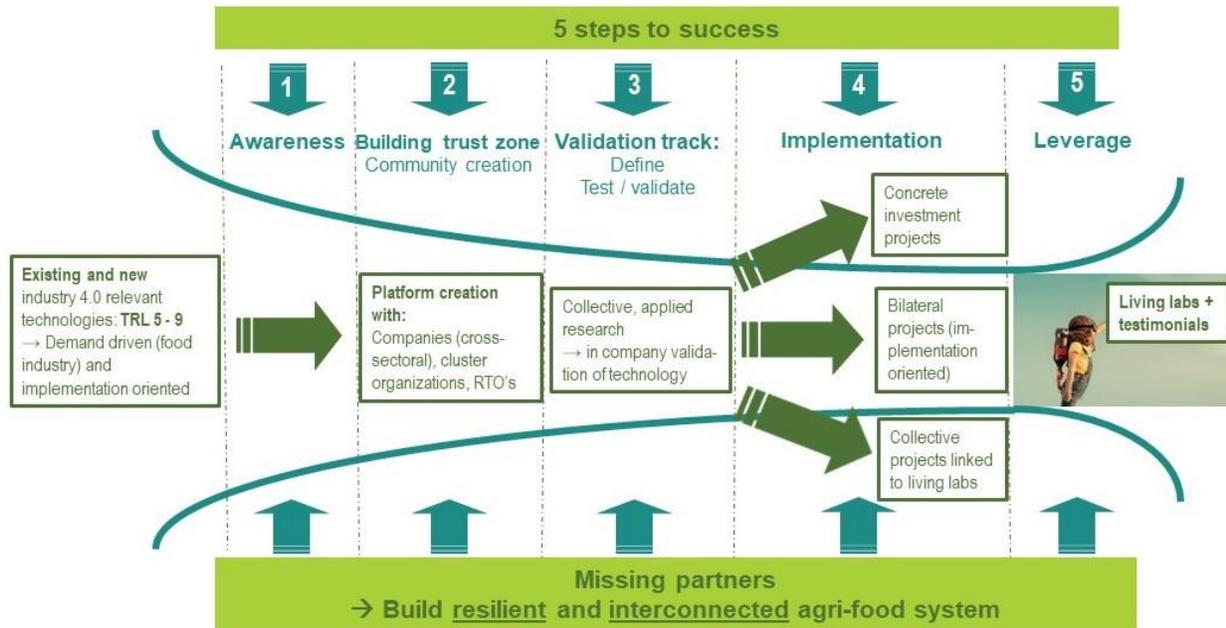
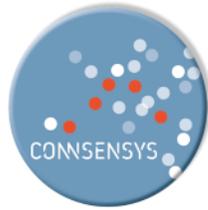
- Machine producers: producers of production machinery for the agri-food industry, producers of robots, etc. These machine producers are very important in relation to the connectivity between the machines of the production process.
- Integrators: can integrate the smart sensors in the production line of the agri-food companies (tailor-made) or collaborate with the machine producers to develop a generic solution for a larger market
- Universities, RTOs, etc. that can provide knowledge, information and guidance to introduce new technologies (not available on the market yet)

Also the start-up and scale-up community will be involved in our ecosystem and new tech companies with fresh and innovative ideas and developments will be closely followed-up by our Partnership.

A special role is also foreseen for the universities and RTOs. Several RTOs are Regular Member of our Partnership or are Associated Organization. They clearly reinforce our community and feed new technologies and digital solutions, available at a lower TRL, into our agri-food system. Our community can be engaged to validate these new technologies and digital solutions and provide feedback for the RTOs.



Based on the lessons learned from previous projects and cross-sectorial collaborations, a 5 step model was developed guiding introduction of Industry 4.0 relevant technologies in the agri-food industry: creating awareness, building a trust zone, evaluation and validation, implementation and leverage creation. The technologies and digital solutions we consider are available at higher TRLs and ready for validation in a industrial environment.



A detailed description of the focus of each step and the activities that fit in each step is given in the following paragraphs.

### **Step 1: Creating awareness:**

Creating awareness is a continuous process during the whole technology integration and implementation process. The key aspects in this process are:

- Identification of specialised clusters and other intermediary organisations (in different regions)
- Inform and convince these organisations to join forces
- Identification of top players (agri-food, technology providers, digital solution providers, etc.) with support of the involved cluster organisations and other intermediary organisations
- Frequent meetings and activities between the Regular Members and Associated Organisations (see Annex 1) to continuously adjust and improve the Strategy and Implementation Roadmap (Annex 3), taking into account new developments and opportunities

The deployment of our Strategy linked to the Industry 4.0 transition of the agri-food industry calls for the collaboration within the defined ecosystem, as well as with regional authorities and regional and national funding agencies.

### **Step 2: Building the trust zone between the involved sectors – community creation:**

The objective of this trust zone and community building is to bring companies and RTOs together in a forum with focus on the digitalisation for the agri-food industry and in this way improve and increase the awareness. A trust zone will be built between the agri-food companies and the technology providers, so the



agri-food companies know which support and solutions they can obtain and the technology and digital solution providers understand the needs of the agri-food companies.

We want to facilitate this by creating a network of living labs, supported by a cross-sectorial and interregional team, supplemented with specialised and customised business support services for the agri-food SMEs. The network should consist of different complementary partners: RTOs, cluster organisations, agri-food companies, machine producers, system integrators, technology and digital solution providers.

Activities will include the following:

- Screening of needs and opportunities for the agri-food industry
- Technology watch on emerging Industry 4.0 innovations
- Generation and support of innovative ideas, networking and partner matching between agri-food companies, technology and/or digital solution providers
- Via a centralized contact point, services are provided concerning Industry 4.0 technologies that are already available for the agri-food industry.
- Furthermore, a number of thematic seminars, workshops, training courses and demonstrations will be organized to promote knowledge transfer.

### **Step 3: Evaluation and validation of new technologies and digital solutions**

The process to get from awareness to validation is a collaborative work in which common goals between all partners should be reached: demonstrate/test/feasibility checks of new technologies and digital solutions towards concrete investment projects. The process of validation gives insight in the specifications needed for industrial applications.

In the validation track the target groups of the project are actively involved: the agri-food companies as well as the technology and digital solution providers, machine producers and integrators for whom the agri-food industry is an important customer. During validation, which can be partly organised in the living labs or on site in the agri-food companies, RTOs can bring technology to a level that technology providers and integrators can take further to implementation towards end users.

### **Step 4: Implementation of new technologies and digital solutions**

Close collaboration between the agri-food companies and the technology and digital solution providers will result in concrete investment projects in the agri-food companies and collective large-scale SME group projects linked to the living labs. When needed, additional partners such as integrators and machine developers will be involved to make the jump from a stand-alone, validated device (demonstrator) to full integration in the production plant.

These projects will be identified, evaluated and implemented and additionally, the technology and digital solution providers can also invest in the living labs, where they can demonstrate their technology and give trainings.

### **Step 5 Leverage**



Integration, investments and realizations in the agri-food industry create visibility for all stakeholders and will help to attract new partners for newly defined validation and implementation tracks and new technologies, which is a supporting evolution to reinforce the funnel.

Therefore demonstrations, training programmes and study visits in the living labs, RTOs and frontrunner agri-food companies will be organised in collaboration with technology and digital providers. Furthermore, the activities, news, events, testimonials, success stories and concrete results will be distributed and disseminated via newsletters, presentations, etc. This will enable the cross-fertilisation and speed up the learning process.

Creating leverage also includes engaging and feeding input to policy makers and managing authorities of regional and European funds, in order to ensure the relevance and the likely translation of our Strategy in practice.

As described in the Partnership Agreement the Regular Members and Associated Organisations will closely interact with their respective regional authorities to guarantee the long-term sustainability of our partnership and ensure further financial support from the involved regions.

## **Value proposition of the ‘Smart Sensors 4 Agri-food’ Partnership**

Via the activities and projects of our Partnership, the network of living labs and linked services, we strongly believe we can better support our agri-food companies and engage them to make the leap towards Industry 4.0. If specific knowledge and expertise is not available in the companies’ region, they can be put in contact with companies/RTOs/living labs/etc. from another region within our Partnership where this knowledge or expertise is readily available. The Partnership and the bond of trust that exists between the different member organisations will facilitate the exchange of knowledge and results in a larger and stronger supportive ecosystem for the agri-food companies.

As stated above, competition and duplication within EU regions limits the development of critical scale. Via collaboration between members of our Partnership, coming from different EU regions, we will detect gaps in our network of living labs, services and expertise. Our intensive collaboration, mapping of capabilities and capacities of the community of technology providers and digital solution providers, inventorisation of needs and demands of the agri-food industry, gap detection, etc. will help us to substantiate investment decisions and projects linked to the network of living labs.

Next to the agri-food industry, which is the main target group of our Partnership, the ecosystem of technology and digital solution providers, RTOs, etc. will also clearly gain from and capitalize on this collaboration (see above). As Partnership, engaging organisations active in the different sectors, we will always strive for a win-win and look for new opportunities to further strengthen our Partnership and the agri-food industry in general.