Smart Specialisation Platform on Smart Sensor Systems 4 agri-food

Mapping survey results and future options for developing the platform

21-22 February 2018

Alasdair Reid (Alasdair.reid@Skynet.be)
The rationale for joint action at European level

- Agri-food sector faces significant challenges in applying key digital technology solutions due to (relatively small scale of firms, lack of awareness, etc.)

- Significant (productivity, quality, safety) benefits can be achieved by applying smart sensors, creating IoT environments and enhancing data analytics, etc.

- Access to demonstration, testing and piloting facilities can help agri-food firms assess the return on investment and choose the best available solutions for their needs

- Pool the expertise and existing infrastructure of the partner regions to develop a network of complementary ‘living labs’

5 step model based on Flemish experience

1. Awareness
2. Platform: Community creation
3. Validation track: Define Test / validate
4. Implementation
5. Leverage

- Missing partners
  - Build resilient and interconnected agri-food system

February 2018
S3P Smart Sensors 4 agri-food
Significant differences in key digital indicators for food & drink (broad sector) across countries

Source: https://digital-agenda-data.eu/datasets/digital_agenda_scoreboard_key_indicators/visualizations

Regional mapping survey - 11 surveys received from

• Asturias, Galicia and Navarra (Spain)
• Auvergne-Rhône-Alpes (France)
• Denmark
• Flanders and Wallonia (Belgium)
• Hungary
• Lombardy (Italy)
• Ostwestfalen-Lippe (Germany)
• North Brabant (Netherlands)

Main survey topics:

• Regional challenges and priorities for the agri-food industry in adopting smart sensor technologies
• Strategies and policy measures targeting digitalisation in the agri-food sector
• Regional expertise in smart sensor technologies (leading firms, technology providers, pilot facilities)
• Involvement in European or inter-regional smart sensor/agri-food partnerships
• Priority topics for inter-regional cooperation and future actions
Focus on key technologies relevant for digitalisation of the agri-food sector

- Sensor technologies focused on product quality or safety control such as vision technologies
- Sensor technologies focussed on process efficiency monitoring
- Sensor technologies for localisation (track & trace physical assets, tracking a product during full supply chain, etc.)
- Optimisation (e.g. ultra low-power solutions or miniaturisation)
- (Big) data analytics: mining/analysis/trend and modelling applications, algorithm development, etc. (e.g., enabling corrective actions/ preventive actions)
- Wireless implementation and connectivity of sensors
- Human machine interaction technologies (including augmented reality, haptic feedback, gesture/speech control).
- Sensor technologies to monitor efficient use of resources including water and energy
- Multi-sensor data architecture for deployment of a smart factory where multi-vendor IoT devices are sensed and controlled.
- Smart labelling/packaging solutions
Simplified visualisation of smart electronic technologies in value chain
Challenges facing agri-food firms in adopting smart electronic systems

Average survey response 11 regions (1 = most important to 5 least important)
Importance & actual application of key technologies in regional firms

Largest gap between importance and use for:
- Sensors technologies product quality
- Sensor technologies efficient use resources
- Smart label/packaging

Regions with largest average gap between are:
- Asturias, Galicia, Hungary, and Wallonia

Smallest gap between importance and use:
- Denmark, Lombardy and Auvergne-Rhône-Alpes

**Top three priorities**

<table>
<thead>
<tr>
<th>Technology</th>
<th>Average Importance</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor technologies (product quality or safety control)</td>
<td>3.22</td>
<td>1</td>
</tr>
<tr>
<td>Sensor technologies to monitor efficient use of resources (water &amp; energy)</td>
<td>2.89</td>
<td>2</td>
</tr>
<tr>
<td>Sensor technologies focused on process efficient monitoring</td>
<td>2.78</td>
<td>3</td>
</tr>
<tr>
<td>(Big) Data analytics</td>
<td>3.10</td>
<td></td>
</tr>
<tr>
<td>Wireless implementation and connectivity of sensors</td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td>Smart label/packaging solutions</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Optimisation (e.g. ultra low-power solutions or miniaturisation)</td>
<td>3.75</td>
<td></td>
</tr>
<tr>
<td>Sensor technologies for localisation</td>
<td>3.30</td>
<td></td>
</tr>
<tr>
<td>Multisensor data architecture for deployment of a smart factory</td>
<td>3.25</td>
<td></td>
</tr>
<tr>
<td>Human machine interaction technologies</td>
<td>4.11</td>
<td></td>
</tr>
</tbody>
</table>

- Average actual application of key technologies: 1 state of the art (3 average) to 5 not currently used, or don’t know
- Average importance for regional businesses to adopt technologies: Rank 1 critical to 5 low priority, or don’t know
Technological specialisation of partnership

10 regions specialised
- Denmark and Flanders, highly specialised

Nine regions specialised
- Flanders, Hungary, Auvergne-Rhône-Alpes and Walonia highly specialised

Seven regions specialised
- Galicia and Lombardy Highly specialised

Six regions specialised
- Flanders, highly specialised

Six regions specialised
- Lombardy, highly specialised

Sensor technologies focussed on process efficient monitoring

Sensor technologies for product quality or safety control (e.g. vision technologies)

Sensor technologies to monitor efficient use of resources (e.g. water and energy)

Sensor technologies for localisation (track & trace assets, tracking product in supply chain, etc.)

Wireless implementation and connectivity of sensors

Smart sensor technologies 4 agri-food

Smart label/packaging solutions
- Three regions specialised
  - No region highly specialised

Human machine interaction technologies
- Three regions specialised
  - Auvergne-Rhône-Alpes highly specialised

Optimisation (e.g. ultra low-power solutions or miniaturisation)
- Four regions specialised
  - Auvergne-Rhône-Alpes & Flanders highly specialised

(Big) Data analytics: mining/analysis/trend and modelling applications, algorithms, etc.
- 10 regions specialised
  - Asturias, Navarra & North Brabant highly specialised

Multi-sensor data architecture for deployment of a smart factory with multi-vendor IoT devices
- Six regions specialised
  - Lombardy and OWL Highly specialised
## Top five priorities for future activities

(1 top to 5 lowest priority)

<table>
<thead>
<tr>
<th>Type of activity</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong> Mapping specialist expertise in smart electronic system technologies in each region</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Step 1:</strong> Mapping leading regional firms in agri-food value-chains/clusters to identify potential synergies</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Step 2:</strong> Partner search, match-making and brokerage services for platform development</td>
<td>2.50</td>
</tr>
<tr>
<td><strong>Step 2:</strong> Sharing of best practices with regard to the implementation of smart sensor systems in the agri-food industry.</td>
<td>2.78</td>
</tr>
<tr>
<td><strong>Step 3:</strong> Co-development of demonstration and living labs for smart sensors in agri-food</td>
<td>3.13</td>
</tr>
<tr>
<td><strong>Step 3</strong> Create an inter-regional network of research and innovation centres that businesses can access (e.g. using an inter-regional innovation voucher)</td>
<td>3.33</td>
</tr>
<tr>
<td><strong>Step 4:</strong> Co-investment in living labs demonstrators, pilot applications, technology validation actions, etc.</td>
<td>2.71</td>
</tr>
<tr>
<td><strong>Step 4:</strong> Cooperation on mobilising financial support for smart sensor projects – e.g. pooling of regional funds through a joint programme initiative, development of an investment platform</td>
<td>1.88</td>
</tr>
<tr>
<td><strong>Step 5:</strong> Leverage of existing living labs through impact assessment and testimonials / dissemination activities towards other EU regions.</td>
<td>3.17</td>
</tr>
</tbody>
</table>
Priority topics based on survey responses

1. Development, testing and application in companies of sensors for process control and efficiency (real time/conditions quality control) and efficient use of resources.

2. Data analytics for food factory management systems and improving data exchange and information management along food chain (e.g. shelf-life sensor data during production, logistics operating systems, food quality and safety and consumer information.

3. Inter-regional networking and joint development of applied R&D, demonstration sites, smart (test) factories and living labs – focus on food processing but interest in applications along chain from farming (incl. animal health) to final consumer.
Tentative outline roadmap

**Awareness**
- Survey of agri-food sector needs
- Detailed mapping of ICT suppliers
- Joint working groups on specific key technologies

1st semester 2018

**Platform**
- ‘Business model’ and financial plan
- Match-making meetings
- Extending to additional partners (in regions and new regions)

By Sept. 2018

**Validation**
- Feasibility studies / co-development of living labs
- Open Innovation network (pilot actions agri-food and ICT suppliers)
- Inter-regional network of open access RTOs

3Q 2018-3Q 2019

**Implementation**
- Co-investment in joint demonstration and validation actions
- Development of network of 'living labs'
- Securing additional funding

2nd Semester 2019- onwards

**Leverage**
- Creation of European level PPP - 'Smart Food Companies'
- Long-term technology roadmap
- Promotion and extension of living lab

2020-onwards

---

February 2018

S3P Smart Sensors 4 agri-food
Illustrative governance structure (2018-19)

- Preference for ‘light’ structure – MOU
- Experience (Vanguard Initiative pilots) suggests need for FTE ‘platform manager’
- Supported by management board and specific regions taking lead on sub-activities

- Platform Manager
  - Business cluster partnerships
  - Business needs survey
    - Match-making / cluster events
  - Thematic working groups
  - Joint project development
  - Living labs network
  - Management Board
    - COSME
    - INNOSUP
    - Pilots (e.g. food processing apps)
    - Smart (pilot) factories
    - Other sources
  - Smart sensors
    - Data analytics and exchange
    - Other technologies...
Discussion topics

• How well does the survey reflect your regions position, what additional data or evidence needs collected?
  • E.g. joint survey on business needs
  • More detailed mapping of technology providers

• Should there be a more focused approach on selected key technology applications (or do we need to add additional technologies?)

• Should the partnership be extended to ensure a broader coverage of technology expertise or sub-sectors of agri-food, etc.

• Should the initial focus on food-processing sector be extended to the application of smart sensor technologies in other parts of the food chain?

• Which regions are interested in leading on specific topics or actions?