



NGIoT Workshop: IoT and Edge Computing – Future directions for Europe



Session 1 Five years from now – Key Scenarios and Emerging needs in Edge IoT

Food/Farming

A photograph of a farmer wearing a blue cap and a red shirt, holding a tablet computer. The farmer is standing in a lush green field, looking at the tablet. The background is slightly blurred, showing more of the field and some distant trees.

Food & Farming

Scenarios & Needs in Edge IoT

IoF2020 and SmartAgriHubs are realising over 80 initiatives:

- 33 IoF2020 Use Cases
- 28 SAH Innovation Experiments (IEs),
- 13 experiments in response to COVID-19
- 13 hackathon type of activities to generate IEs

Presenting a broad overview

1. Challenges for Digital Transformation
2. Key Scenarios for Edge IoT in Food & Farm
3. Emerging Needs
4. Support for Digital Innovation

Challenges for Digital Transformation

Technical – Rural areas are characterized by a lack of:

- Fast Fibre Optic Networks in order to provide high-speed internet access
- Available 5G mobile networks with a broad coverage for mobile internet apps

Financial – Costs of produce and profit are rather low

- Limited willingness to invest, due to long payback periods
- Investment to be made by stakeholders, not necessarily harvesting the benefit

Organisational – Global marketplace with regional & environmental challenges

- International directives and rather local implementation
- Dynamic food supply networks, anonymous relation to consumers and influence by weather conditions
- Oligopoly of retailers & food producers supplied by over 10 Mio. of farmers in the EU (i.e. 96% family owned businesses in 2016*)



Digital Transformation of Agri, Food, Nutrition & Health in 4 areas

3. Public decision-making

Food Safety

Environment

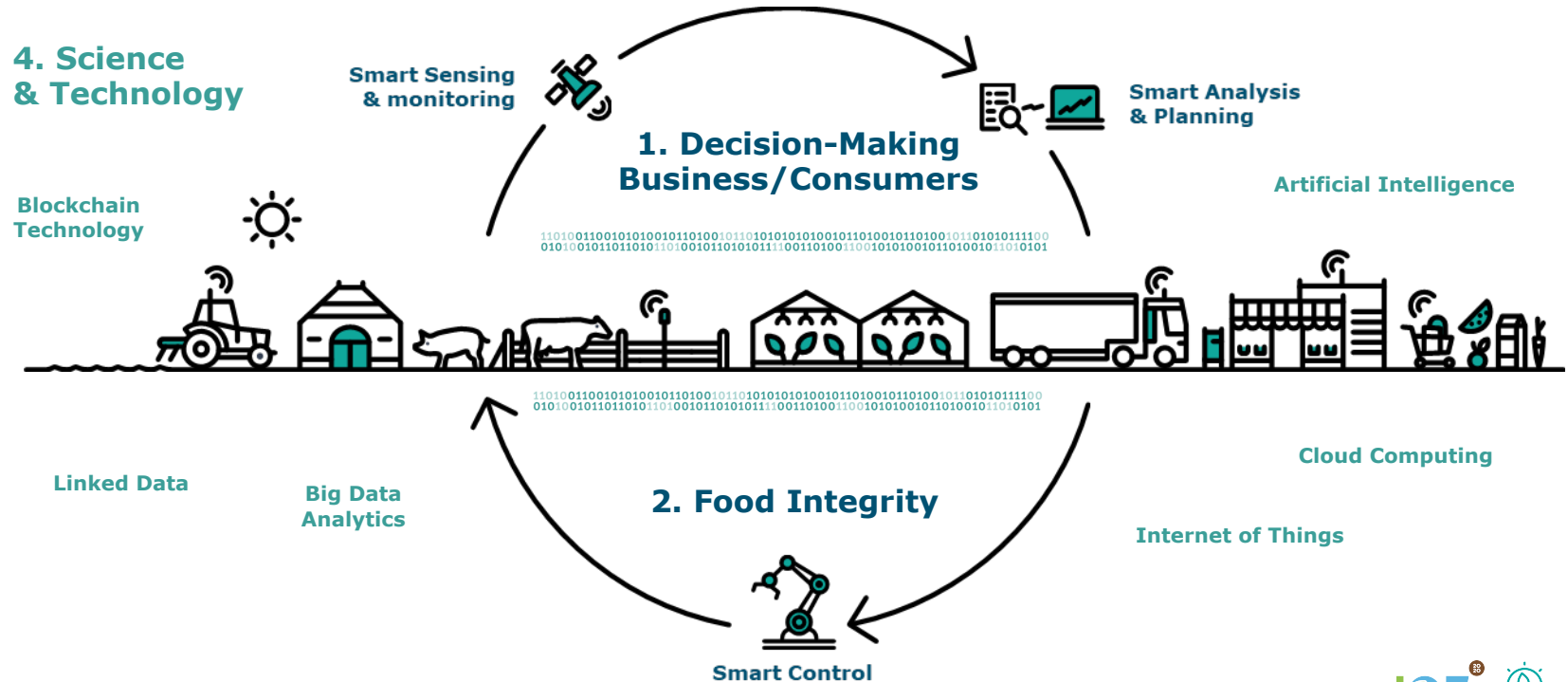
Nutrition

Climate

Health

Food Security

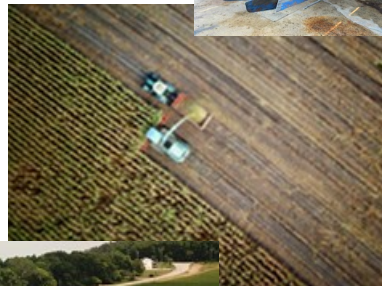
4. Science & Technology



Scenarios for Edge IoT in Farming

Predictive Analysis:

Early detection of deviation (e.g. health), by analysing video streams, noise, temp., gas concentration



Automation:

Autonomous driving of collaborating and interacting objects, supplied by diverse OEMs, facilitating precision farming



Tracking & Tracing:

Monitoring pasture, location, origin, health with collar, tags and rumen bolus



Animal Welfare:

Growth control by optimal feed intake; haptic feedback for animal handling



Supply & Demand:

Right time control of environmental conditions (e.g. light recipes) – towards vertical farms with harvesting robots



Scenarios for Edge IoT in Food

Intelligent Logistics:

Avoiding installation costs, managing governance, enabling dynamic routing, avoiding waste & CO² emission

Process Control:

Using smart objects owned by external entities for internal analysis & control as well as optimising supply & demand



Balancing Supply:

Right time delivery of packaging, assuring hygiene, preventing theft



Augmented Reality:

Comparing digital twins with own preferences; enabling consumers to understand produce quality and value their choice just in time; "Just Walk Out" systems; autonomous delivery



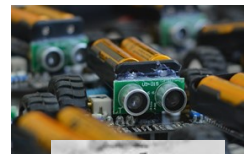
Smart Trays:

Monitoring location, analysing freshness, tracking produce history, autonomous routing

Farming & Food – Trade-Offs and Needs

There are many scenarios – however, edge-IoT needs to consider:

- Processing power versus **battery** life-time
- Need for increasing **bandwidth** and communication cycles
- Harsh conditions vs. reuse & **costs of devices**
- Varying **accuracy** of different sensor types; need for certification?
- SPT by Design!?
- Many solutions would exist, if the costs wouldn't have exceeded the benefits.
- Value not generated by data but knowledge – need for business models that enable profit/costs sharing – help consumers to understand value of farmers' work



Digital Innovation Hub supported Network

DIHs are funded by SAH to facilitate the realisation of Innovation Experiments (IEs) (i.e. 70-100% of eligible costs)

RESTART & EXPAND Open Calls:

- RESTART: Hackathon type of activities, to generate IEs (max. 60 kEUR funding)
- EXPAND: DIH are supporting IEs (max. 500 kEUR funding)
- 05.11.20 next Proposal evaluation deadline

<https://smartagrihubs.eu/portal/open-call>





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SMART AGRI HUBS



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Disclaimer: The information about the open call in this presentation is provided "as is" at the time of preparation. The specific open call announcement documents will specify the details to be taken into account for proposal preparation. Therefore, the terms set out in the Open Call document shall take precedence over those in this presentation. Especially with respect to potential future open calls (i.e. not yet published) the user thereof uses the information at its sole risk and liability.