Smart Food and Agribusiness: Future Internet for Safe and Healthy Food from Farm to Fork

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Presentation Outline

- Background on the FI-PPP program
- Why SmartAgriFood?
- High-level project overview
  - Objectives
  - Consortium
  - Approach
  - A flavour of work in progress
- Conclusions
- Brief outlook on the next phase

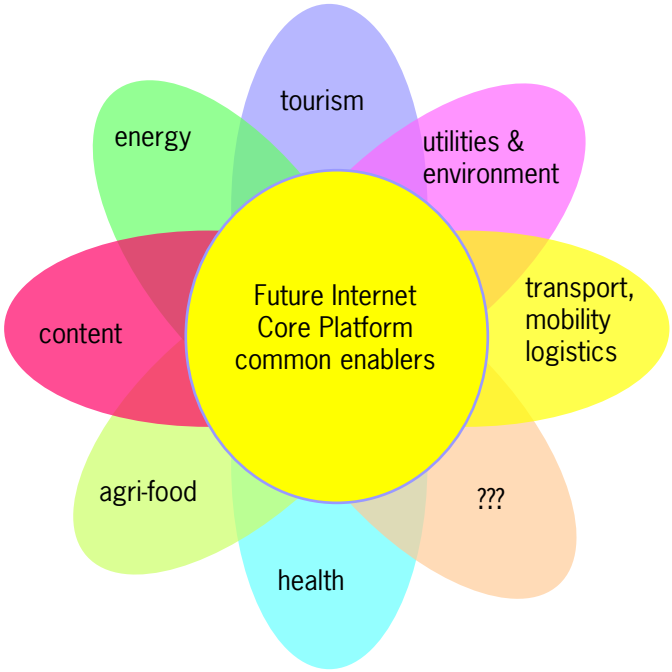
EUROPEAN ROADMAP TOWARDS DIGITAL ECONOMY

- Digital Single Market
- Openness and interoperability even in absence of standards
- Increased online trust and security
- Internet for all through improved coverage
- Funds for innovation and ICT research
- Digital inclusion
- Digital public services

FI PPP ADDRESSING THE IDENTIFIED CHALLENGES

- Builds upon and complement existing efforts in FI research
- Bridges the gap between
  - Private and public interests,
  - Demand and supply side stakeholders,
  - The technology development, deployment and commercialization
- Led by industry and driven by users
- Break down the proprietary barriers between different applications, platforms and sectors
- Address regulatory and legal barriers, drives policy

ORIGINAL IDEA



Break down the proprietary barriers between different applications, platforms and sectors

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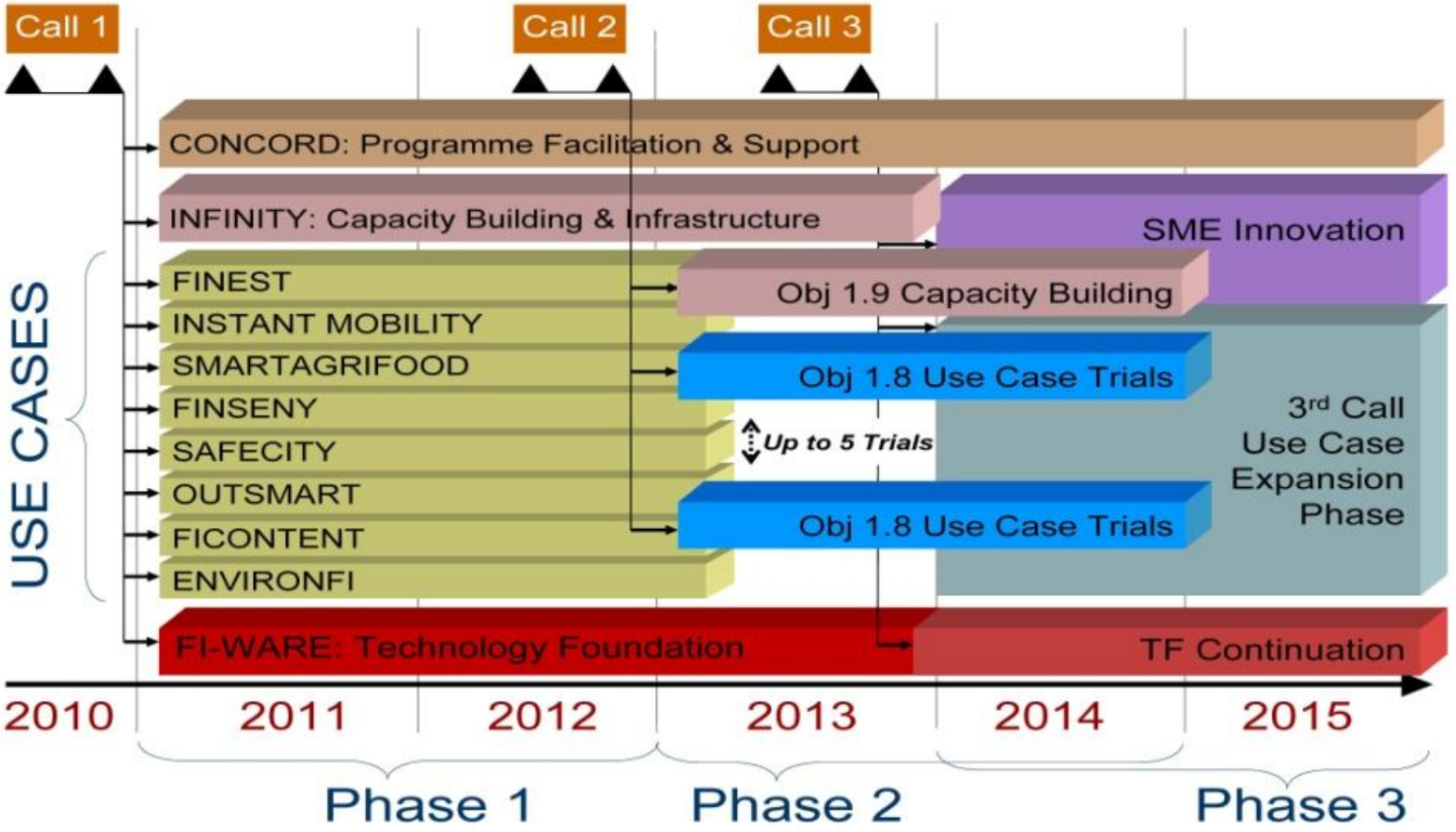
FI PPP PROGRAMME IMPLEMENTATION



Why SmartAgriFood?

- The agri-food cluster is an important European pillar
  - With about 40 % of the EU's land area being farmed, agriculture has a very important impact on the natural environment (Eurostat 2010)
  - The food and drink industry is representing 13% of EU manufacturing sector turnover (CIAA 2010, data 2007)
  - The EU is the world's largest food and drink exporter with a share of EU exports to world markets of 17.5% in 2008 (CIAA 2010)
  - Share of agri-food logistics in the EU road transport is about 20% (Eurostat/TLN 2008, data 2007)
  - 11% share of agriculture-related products in total export value of EU countries in 2009 (Eurostat Comext trade data / Eurostat)
- Agri-food is facing big challenges: feeding the world within the carrying capacity of planet earth
  - More efficient use of resources and production increase ('2x more with 2x less')
  - Minimize waste and energy for reducing the ecological footprint
  - Transparency and effective communication in the supply chain networks

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Smart Agri-Food

State of the art and bottlenecks of ICT in agri-food

- Several initiatives/EU-projects in which partners were already involved:
  - FutureFarm, agriXchange, CuteLoop, TransparentFood, TRACEBACK, Manufuture\AET, Food4Life, High Level Groups, ICT-agri ERAnet, etc.
- Known state of the art regarding ICT
  - large amounts of data and fragmented applications
  - poor level of integration
  - insufficient support for intelligent user support
- INTEGRATION is the grand challenge!
- Underlying issues:
  - Semantic interoperability, data integrity, reliability, trust, scalability, capability to process large amounts of data in global networks.
- This hinders development of the sector on critical issues like food safety, food quality, tracking and tracing , the efficiency in the use of scarce resources , etc.
- The (global) actor network is complex to organize
  - Margins are small, competition is large, different business types, public debates, etc.

➢ **Common approach such as FI-PPP is needed to meet the challenges**

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Objectives Smart Agri-Food (Phase I)

To boost the application and use of future internet ICTs in the agri-food sector by:

- identifying and describing the technical, functional and non-functional **FI-specifications** for experimentation in smart agri-food production as a whole system and in particular for smart farming, smart agri-logistics and smart food awareness
- identifying and developing smart agri-food-specific **capabilities and conceptual prototypes**, demonstrating critical technological solutions including the feasibility to further develop them in large scale experimentation and validation
- identifying and describing existing **experimentation structures** and start **user community building**, resulting in an implementation plan for the next phase

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Smart Agri-Food

21 Partners from 7 European countries

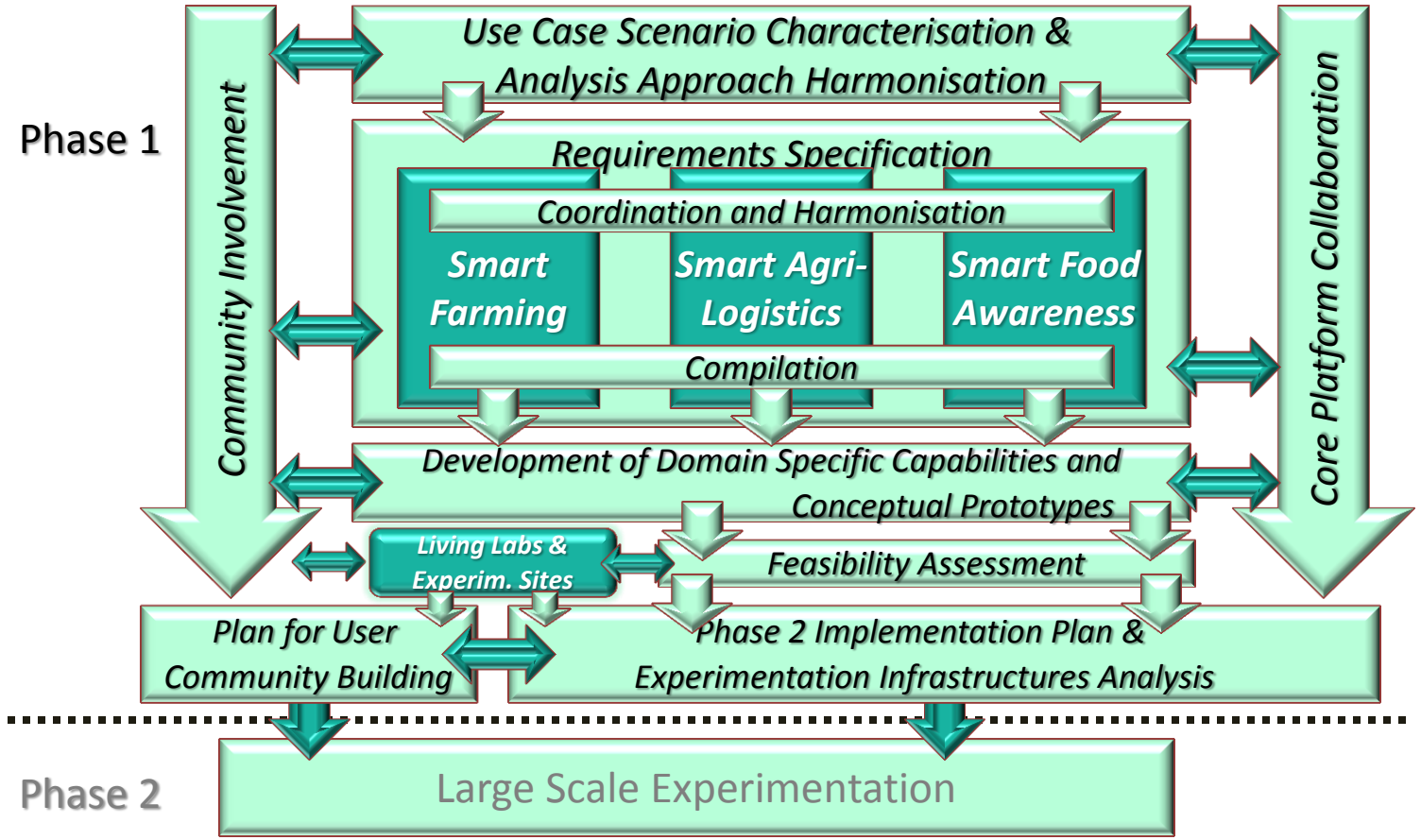
ΟΡΓΑΝΙΣΜΟΣ ΠΛΗΡΩΜΩΝ ΚΑΙ ΕΛΕΓΧΟΥ ΚΟΙΝΟΤΙΚΩΝ ΕΝΙΣΧΥΣΕΩΝ ΠΡΟΣΑΝΑΤΟΛΙΣΜΟΥ ΚΑΙ ΕΠΥΗΕΕΩΝ (Ο.Π.Ε.Κ.Ε.Π.Ε.)

JOHN DEERE

Germany SGS

ΕΘΝΙΚΟΝ & ΚΑΠΟΔΙΣΤΡΙΑΚΟΝ ΠΑΝΕΠΙΣΤΗΜΙΟΝ ΑΘΗΝΩΝ
NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS

Overall strategy for SmartAgriFood (Phase 1)



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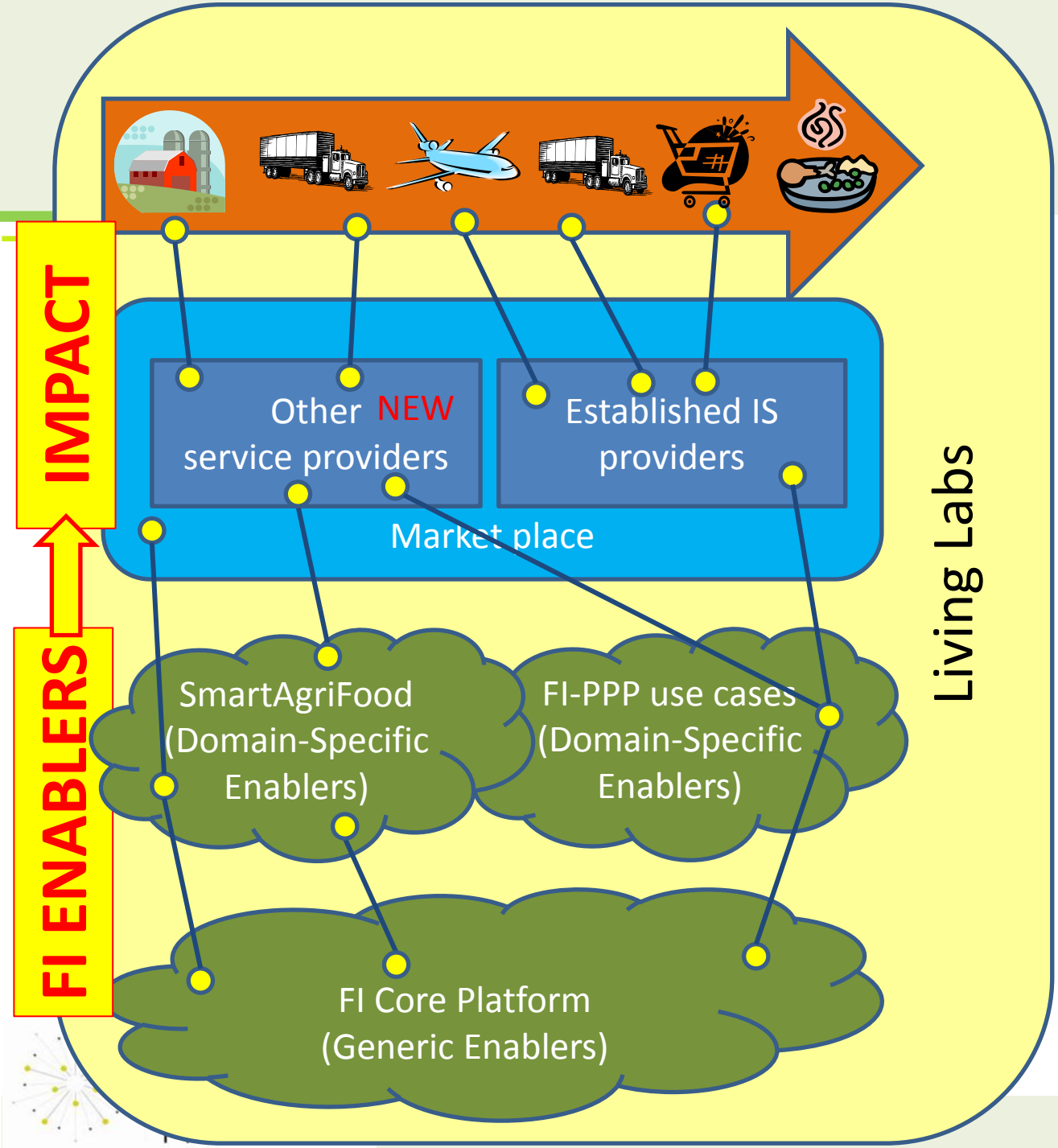
Framework for stocktake and analysis



- Vision for FI-PPP phase 2 is being formed
- Stocktake of potential stakeholders for each component
- Initial focus is on current pilots
- Exchanging ideas with other use cases and INFINITY

Smart Agri-Food

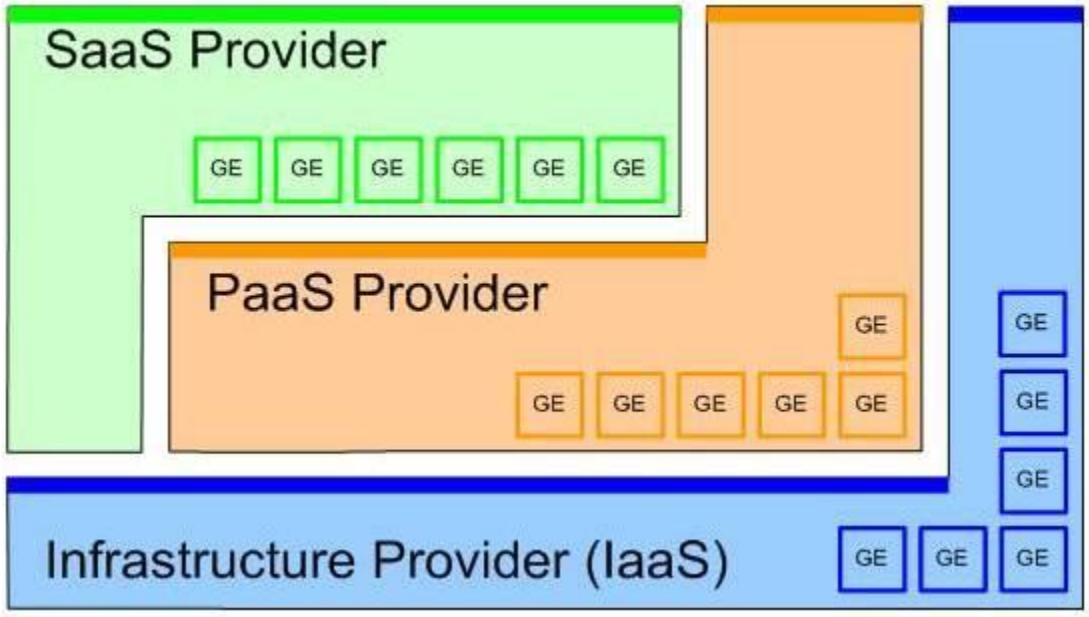
FI-WARE Core Platform

The Reference Architecture of the FI-WARE platform is structured along a number of technical chapters, namely:

- Cloud Hosting
- Data/Context Management
- Internet of Things (IoT) Services Enablement
- Applications/Services Ecosystem and Delivery Framework
- Security
- Interface to Networks and Devices (I2ND)

See http://www.fi-ware.eu/our-vision/ for detailed information

FI-WARE XaaS stacked model



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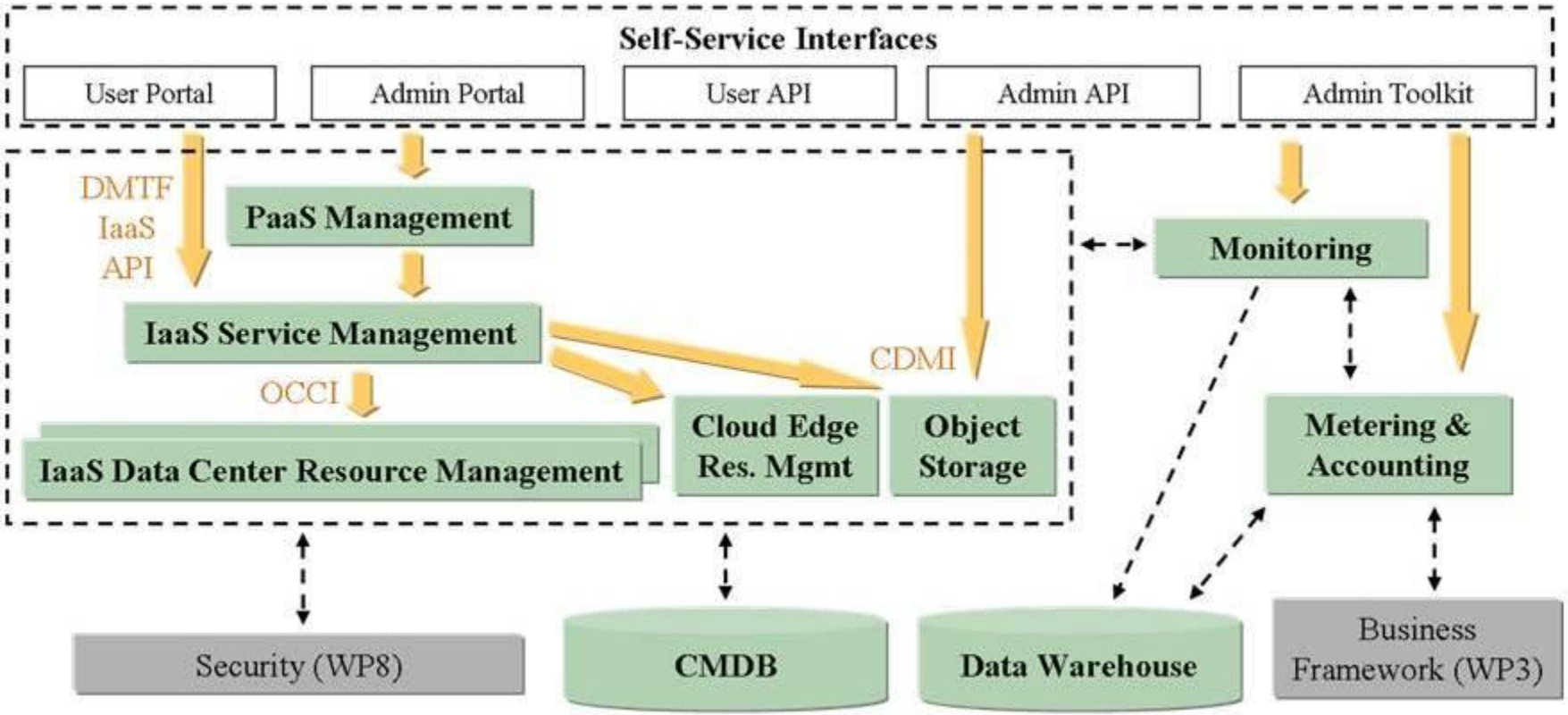
FI-WARE Cloud Hosting Reference Architecture



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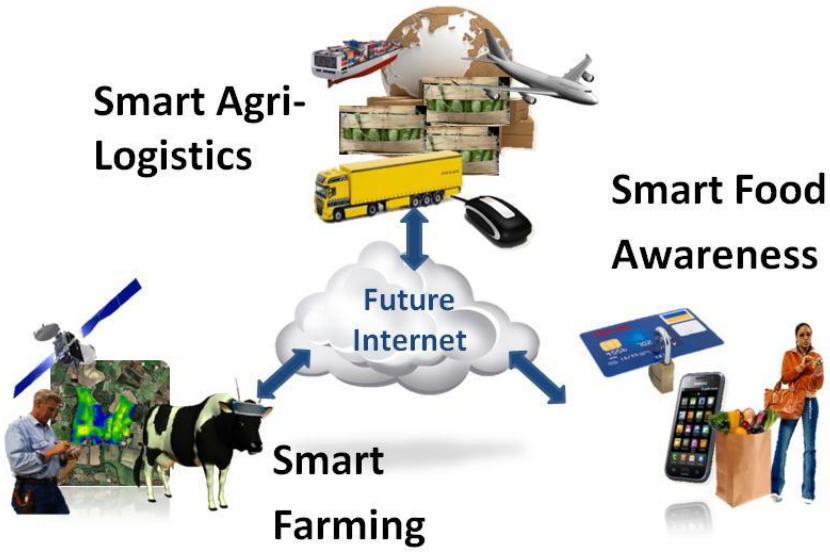
SmartAgriFood: 3 use case domains – 6 pilots

- Quality Controlled Logistics in the Flower SC
- Quality Controlled Logistics in the Fruits & Vegetables Chain



- Tailored Shopping Experience
- Tracking & Tracing for Meat Awareness

- Smart Spraying
- Smart Greenhouse Management

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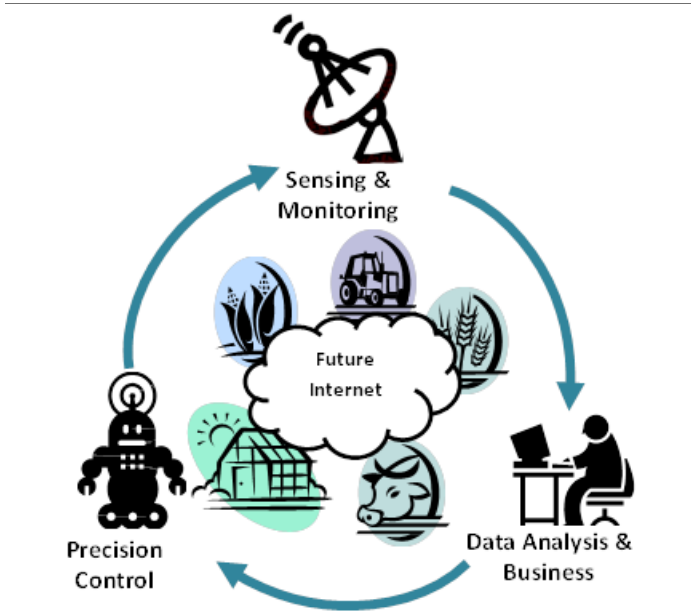
WP200 Smart Farming

- **Smart Farming**
  - sensors and traceability

  - concerns first the use of sensors and monitoring, decision support systems and precise input application so as to make the use of resources more efficient in food production, and secondly concerns ways to improve traceability and the flow of data along the food supply chain



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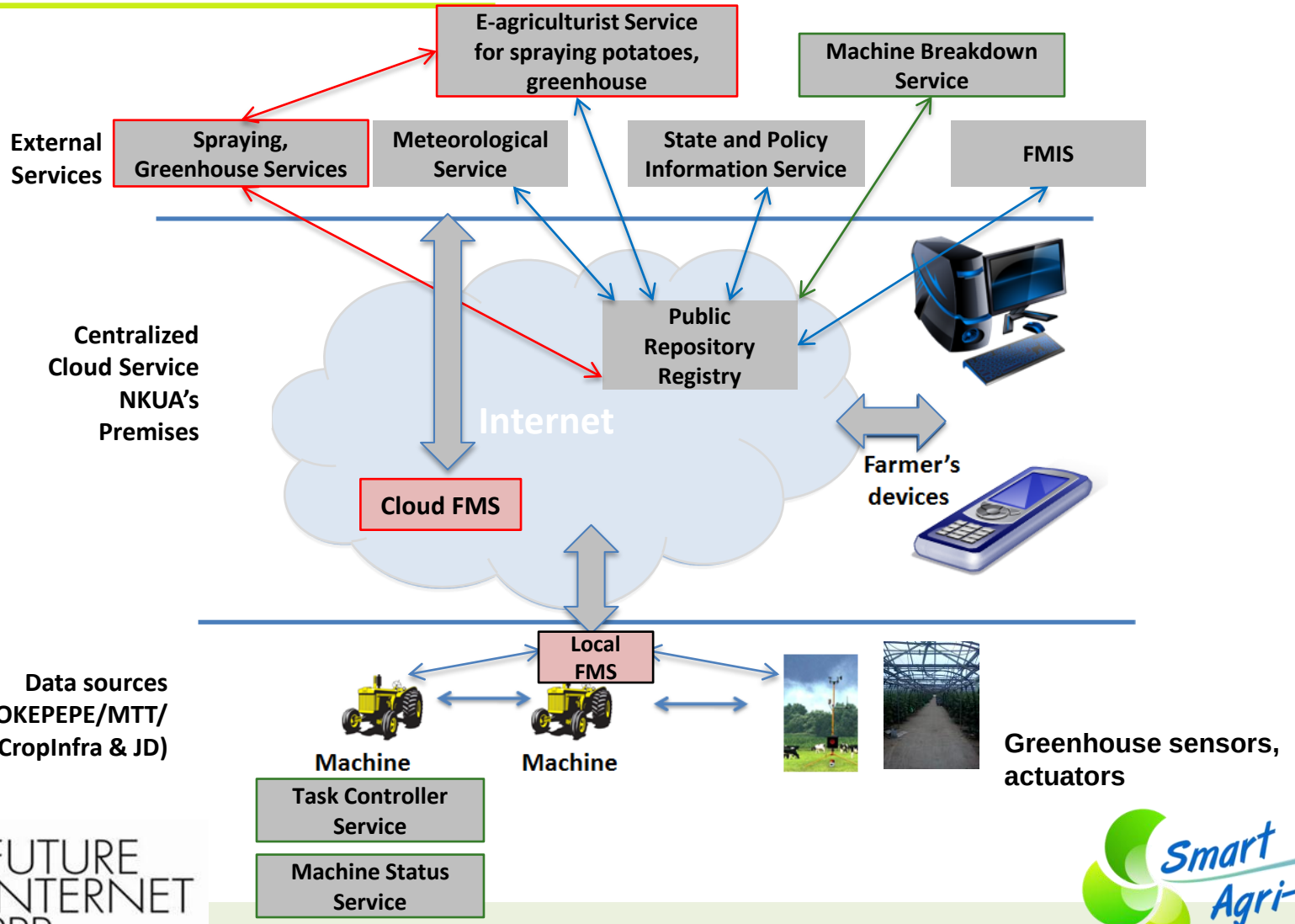
Overall Architecture

Greenhouse and Spraying Use Case Pilot



Cloud Event Management System

Virtual Location A

Virtual Plant

Virtual Location B

Locatio

Environ ment update

Plant location update

Location B

Environ ment update

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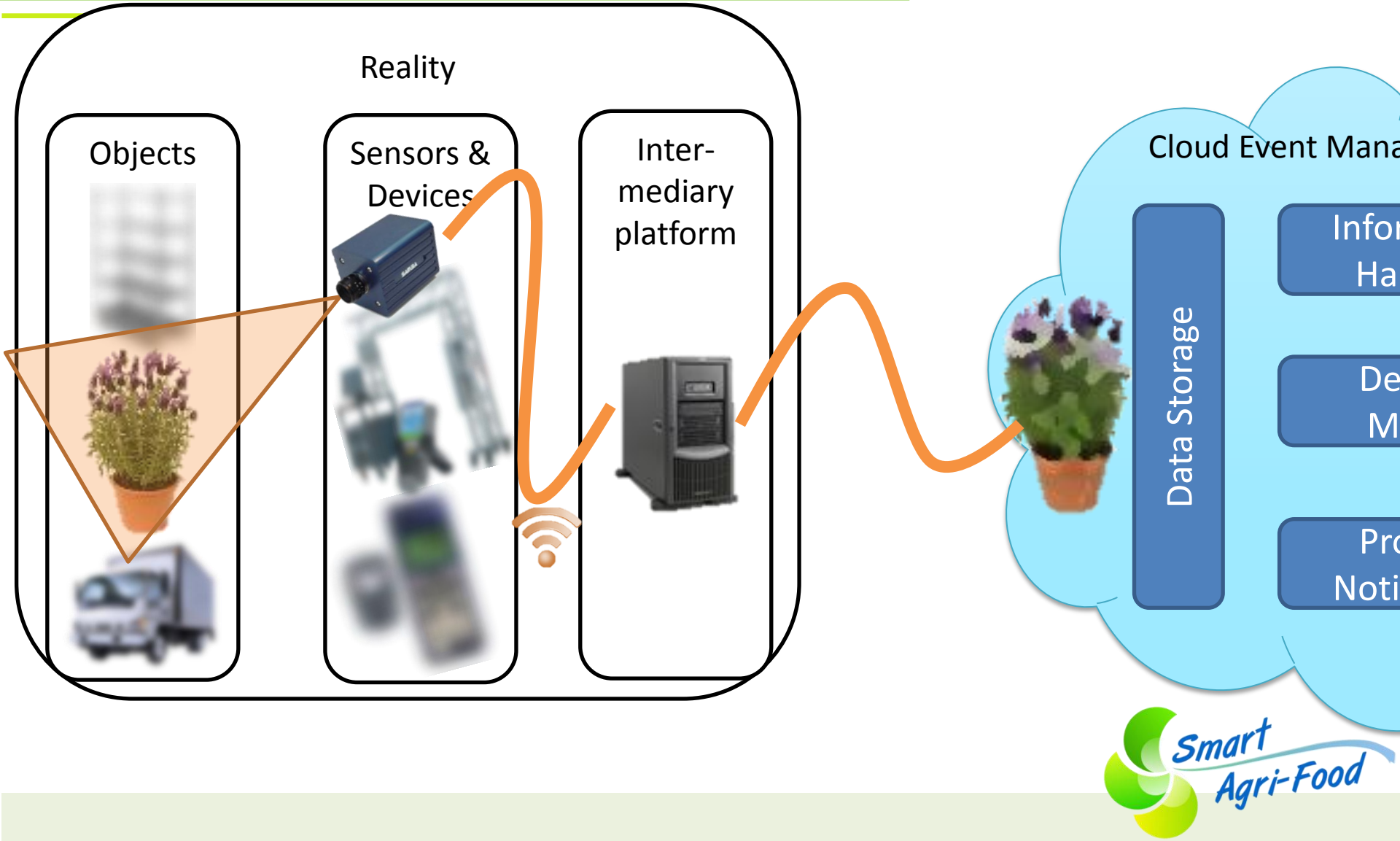
Main components of the prototype



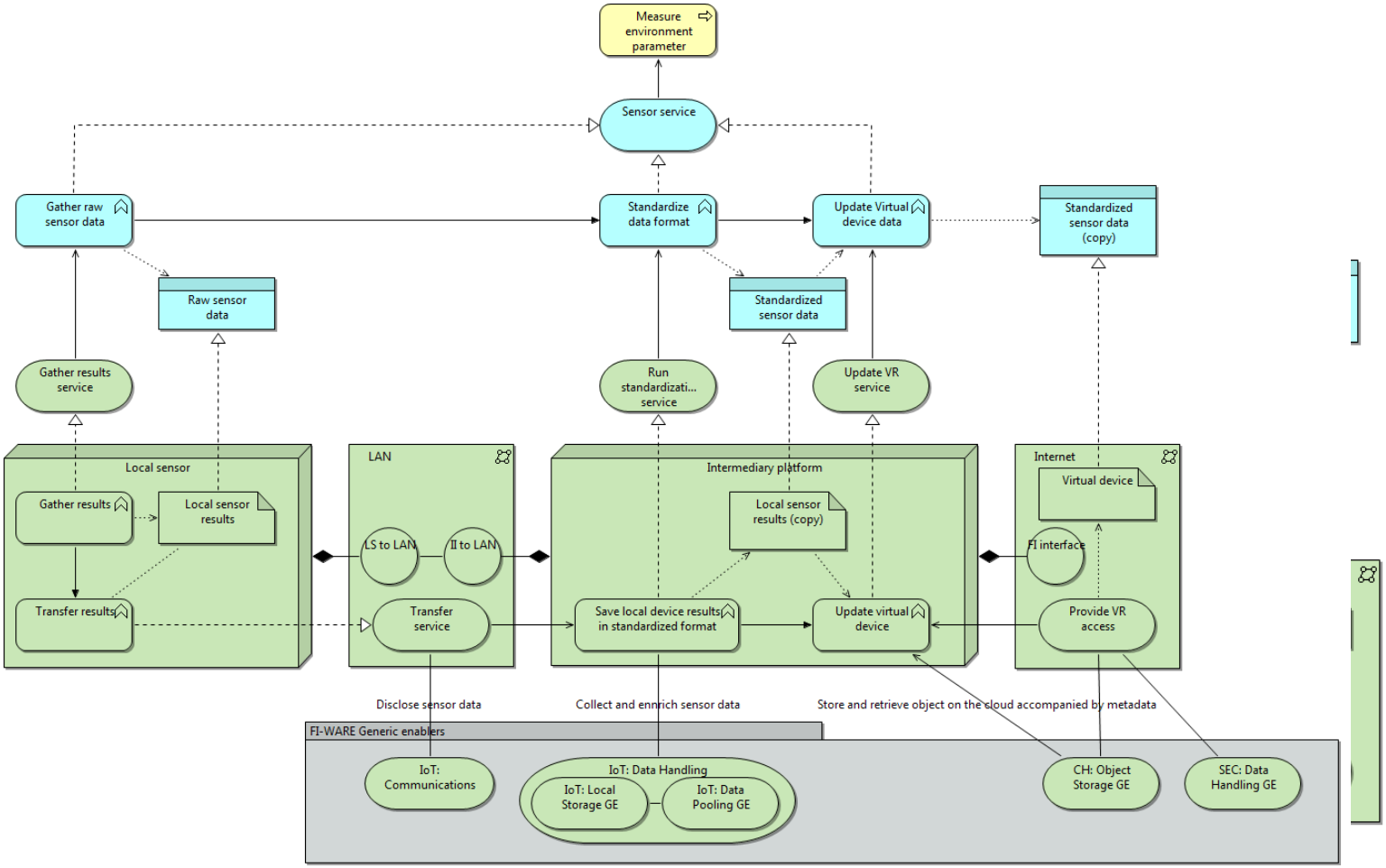
Example component description

Business layer

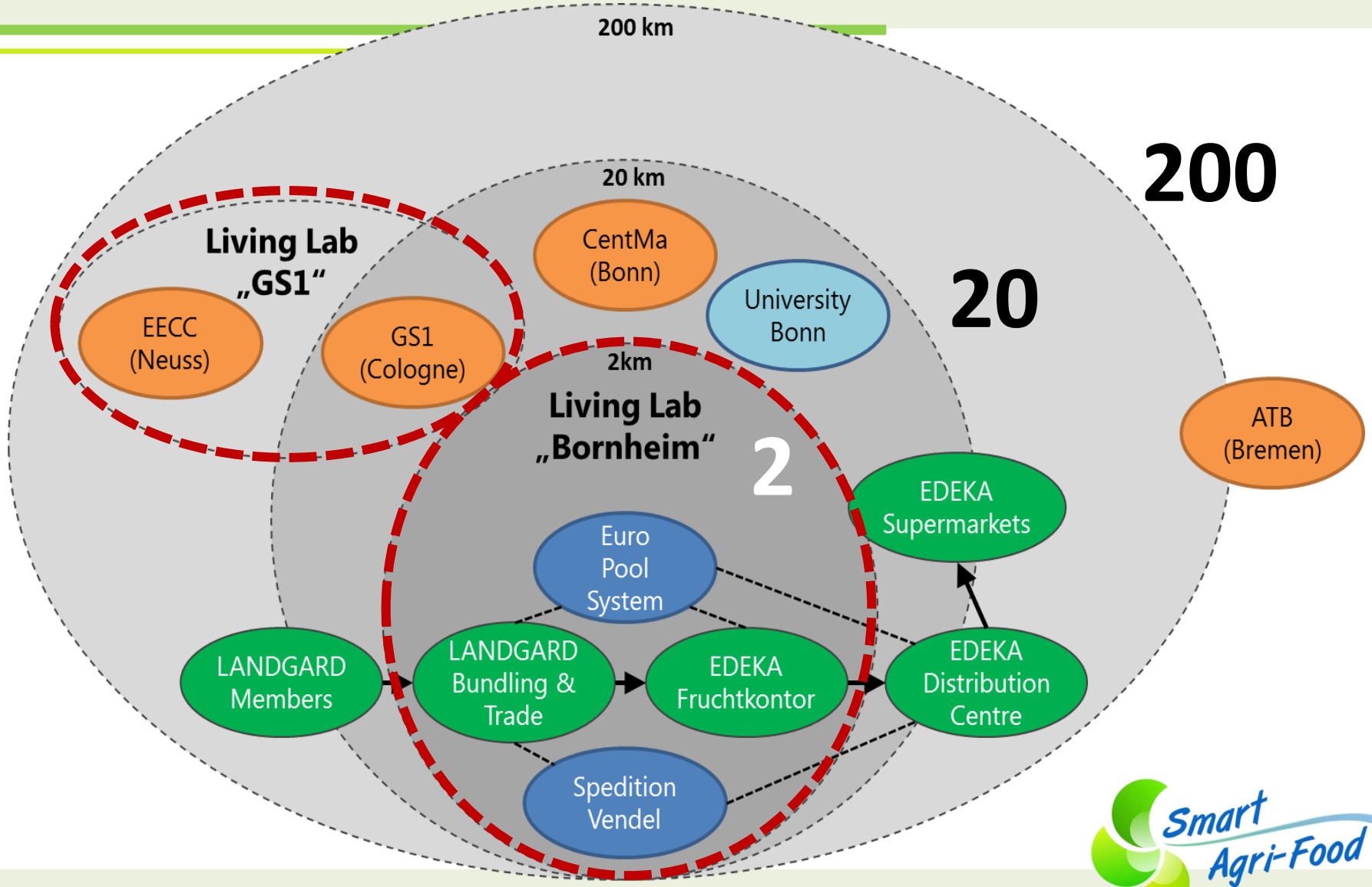
Application layer

Technology layer

Link to FI-WARE GEs



Experimental sites - distance between participants



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Objective of the Smart Food Awareness

- To satisfy needs of each consumer by providing transparent and tailored information about agrifood products, using FI.

Smart Food Awareness: how?

- Each product contains information gathered through all supply chain.

- Each consumer defines his/her shopping profile.
- Product scanning (RFID, barcode ...)
- Image recognition (logos/signs)
- Consumer gets tailored information of the product and/or logo.
- Each logo/sign has several criteria that has to accomplish.

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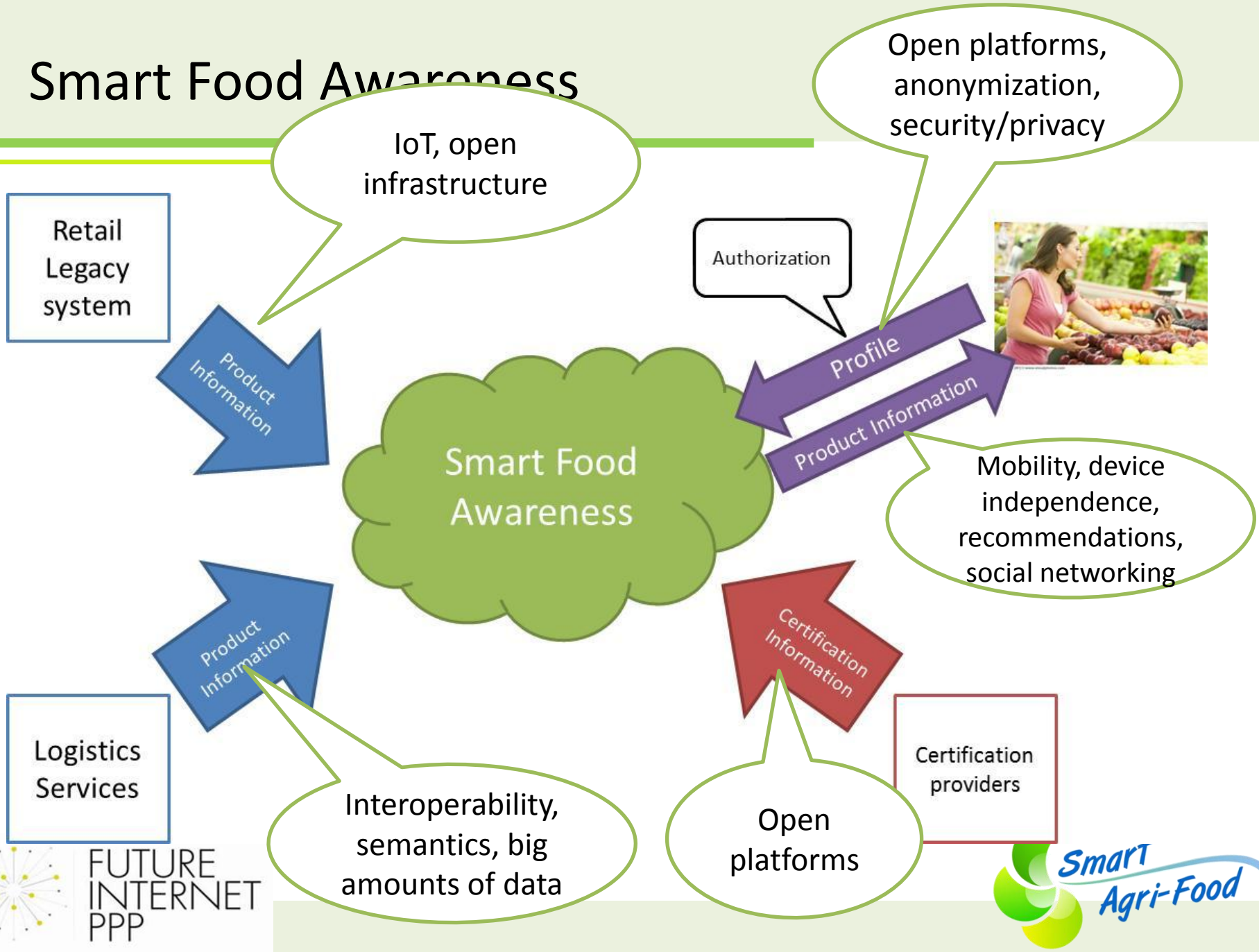
Smart Food Awareness



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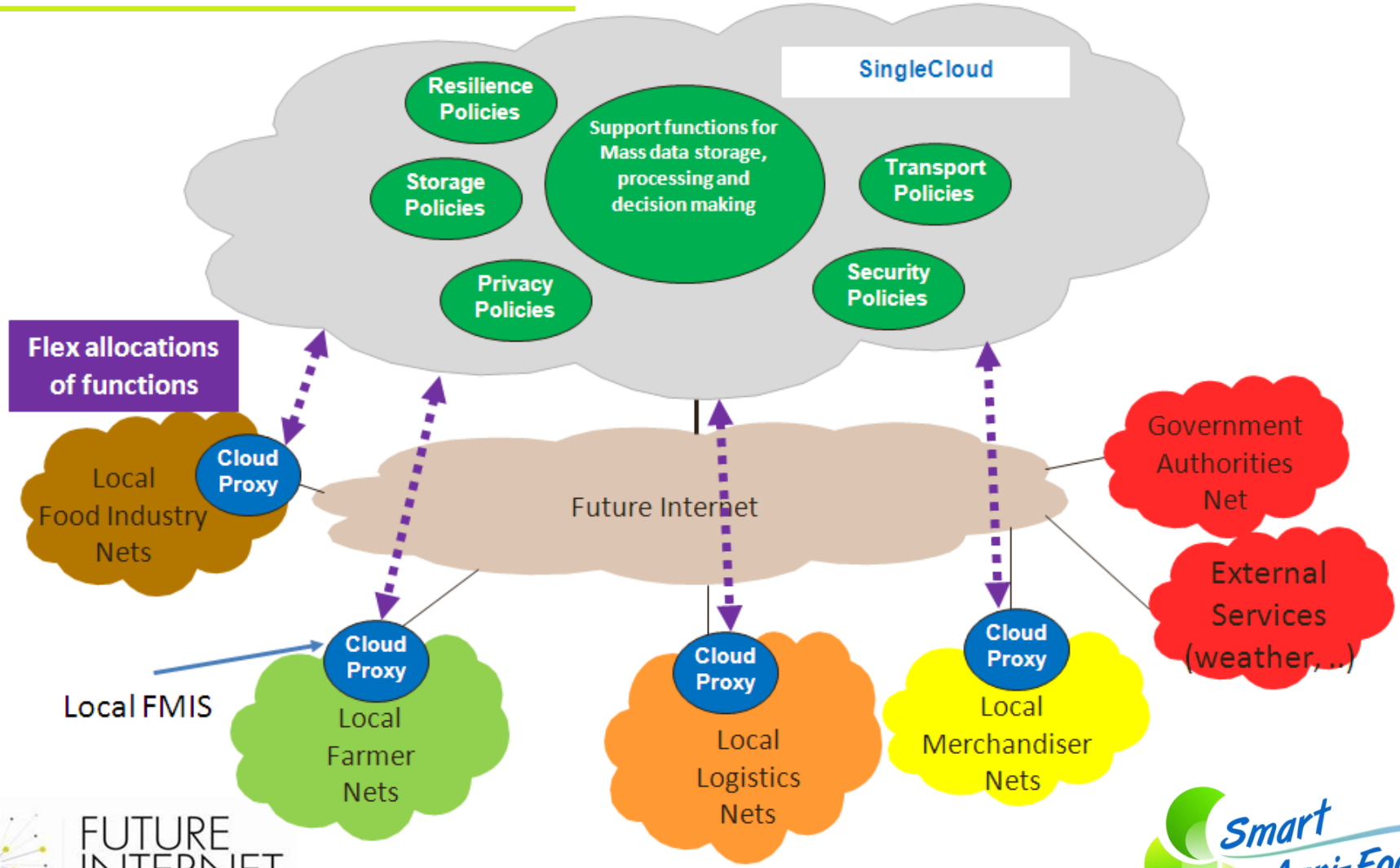
Vision for FI application potentials
hybrid network architecture



To conclude (1)

- The SmartAgriFood project will
  - boost the application and use of future internet ICTs in the agri-food sector
  - increase the competiveness of the European agri-food cluster and related (ICT) service industry in order to meet the global challenges for food production
  - enhance the dialogue between the user community and the ICT community to identify, develop and test new concepts for better exploitation of the Future Internet in the agri-food sector

To conclude (2)

- SmartAgriFood is a challenging, exciting but complex project,
  - User-driven – but do they know what they want?
  - Make a next step towards the 'Future Internet' – what's the future internet?
  - Iterative approach, start with concrete examples/use cases to feed discussions
  - Understanding each other; takes time and needs an active participation
- ...part of an even more complex program (FI-PPP)
  - SmartAgriFood is not just another R&D-project – success and follow-up is in the connection with the Core Platform and large-scale (Agri-Food) user involvement

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Smart Agri-Food

Smart AgriMatics 2012 INTERNATIONAL CONFERENCE

Theme:

The future use of ICT and robotics in agriculture and food business

Dates:

13-14 June 2012

Venue:

Forest Hill, Paris-La Villette, France

Website:

www.smartagrimatics.eu

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ICT AGRI era-net

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Thank you for your attention!

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