



Digitalisation for Agriculture

Webinar 4

Digitalisation as an enabler of agricultural development

April 22, 2021

Welcome to the participants!

- Who are the trainers?
 - Simone Sala
 - Sjaak Wolfert
 - Felix Remboldt

Agenda of the webinar

1. Deep Dive on Blockchain / Digital Ledger Technologies in Agriculture
2. Deep Dive on UAVs (drones)
3. Deep Dive on Big Data & IoT
4. Development of a digital agriculture strategy
5. Q&A



10 min

Icebreaker

Quiz: True or False?

Blockchain / Digital Ledger Technologies in Agriculture

Deep Dive

Blockchain / DLT

Key information

- A Blockchain is a **database** (DB), stored redundantly
 - It is regulated by algorithms and can be **public or private**
 - It has – above Bitcoin – **many applications**, there are many Blockchains
- Better to speak of **Digital Ledger Technologies (DLT)** instead of just the Blockchain
- It allows **recording transactions** with mechanisms for processing, validating and authorizing transactions that are then recorded on an immutable ledger.
 - Blockchain is referred to as an *Internet of value*, meaning a secure way to store and transact value – anything from currency, stocks, contracts and even votes – from one entity to another.

Blockchain / DLT: an Introduction

Centre for International
Governance Innovation

Blockchain / DLT in ag/food

Supply Chains

- A blockchain can assist in providing an immutable record from the provenance to the retail store of a product.
 - Increase **consumers' trust** in the products that they buy
 - **Reward the producers** who employ good agricultural practices
 - Overall support **sustainable farming** and **responsible consumption**

Blockchain / DLT in ag/food Supply Chains

- Italian pasta and pesto sauce manufacturer, **Barilla**, has teamed up with **IBM** to tackle transparency and traceability in its pesto production cycle.
 - All details related to cropping, harvesting, transportation, storage, quality control are tracked and made available on a blockchain system that the customer can verify by scanning the pesto's QR code.

→ This can support food safety

Anticontraffazione. All'insegna di tracciabilità e trasparenza

Cioccolatini e pesto Così il made in Italy entra in blockchain

Con Perugina e Barilla l'alimentare è hi-tech

Pierangelo Soldavini

Il Bacio esce dalla fabbrica della Perugina e non viene perso di vista neanche un secondo, lungo tutto il viaggio che lo porta all'estero, garantendone così la qualità e, soprattutto, assicurando che si tratta effettivamente del vero Bacio e non di un prodotto contraffatto. Intanto nei campi viene seguita la crescita delle piantine di basilico, dalla semina fino alla raccolta per proseguire con la consegna al trasportatore fino allo stabilimento Barilla, pronto a essere trasformato in pesto. Anche in questo caso non c'è un passaggio in cui ciascun singolo lotto possa sfuggire al controllo di qualità dell'azienda emiliana.

All'insegna di tracciabilità, trasparenza e fiducia il "made in Italy" alimentare sposa la tecnologia blockchain e lo fa con due marchi iconici come il Bacio Perugina, oggi controllato dalla Nestlé, e la Barilla con i suoi sughi. Con l'obiettivo dichiarato di rafforzare l'immagine di qualità della materia prima lungo l'intera filiera e il controllo anticontraffazione.

La nuova frontiera della tecnologia che è alla base del bitcoin inizia a mantenere le sue promesse di innovazione "disruptive" sbarcando nell'economia italiana con due progetti che realizzano il tracciamento sicuro e trasparente della filiera produttiva. Barilla ha avviato

con Ibm Italia una sperimentazione in cui è coinvolto un singolo produttore di basilico con una tracciatura "dal campo alla tavola": il produttore ha già inserito nella blockchain, appoggiata sull'infrastruttura cloud di Ibm, tutti i dati relativi alla coltivazione, dall'irrigazione agli antiparassitari per garantire l'effettiva sostenibilità; poi al momento dello sfalcio, ogni singolo lotto sarà seguito fino alla consegna. «Barilla è un'azienda

L'ECOSISTEMA

Alessandro La Volpe (vicepresident Ibm Cloud): «La firma digitale diventa garanzia di fiducia lungo tutta la filiera»

alimentare di marca che vive grazie alla fiducia dei clienti: garantire in maniera sicura e trasparente l'assoluta qualità della materia prima è un nostro obiettivo fondamentale e stiamo sperimentando la tecnologia blockchain per perseguire tale obiettivo», spiega Roberto Magnani, vice president logistica di Barilla Group, anticipando che, se si verificherà efficace, il progetto potrà essere esteso a tutti i prodotti del gruppo, a partire dal grano, dai pomodori e dal latte.

Anche Nestlé Italiana sfrutta il valore della blockchain per

certificare la tracciabilità delle esportazioni del Bacio Perugina dalla fabbrica italiana agli importatori e distributori globali, grazie a un progetto pilota in partnership con Microsoft: anche in questo caso la blockchain integra le informazioni dei diversi attori coinvolti nella filiera estesa delle esportazioni, produttori, trasportatori, spedizionieri, operatori portuali, importatori e distributori.

Microsoft ci ha messo l'infrastruttura cloud di Azure: sono qualche decina i progetti pilota che l'azienda sta studiando per aziende italiane. «Si tratta di progetti snelli anche dal punto di vista dei costi - spiega Fabio Moiola, direttore Enterprise Services di Microsoft Italia - il vero costo non è la tecnologia in sé, quanto la realizzazione dell'ecosistema dell'intera filiera».

La scommessa di Barilla e Nestlé testimonia che la blockchain può rappresentare una grande opportunità: «È uno strumento che può certificare il "made in Italy" rispetto a quello che non lo è: la firma digitale diventa garanzia di fiducia - afferma Alessandro La Volpe, vicepresident Ibm Cloud -. Come hanno già dimostrato colossi come Maersk nella logistica e Walmart nella supply chain si tratta di una responsabilità condivisa tra tutti gli attori che si trasformano, grazie alla tecnologia, in sicurezza, trasparenza e tracciabilità».

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Blockchain / DLT in ag/food

Supply Chains

- In **India**, a research on the use blockchain technology for **fertilizer subsidy disbursements** to farmers have been implemented
 - Combining DLT with digital ID to assist in efficient and targeted delivery of many government-to-citizens (G2C) services
- Streamline the distribution of subsidy payments to farmers without the need for documents or multiple points of authorization.
- Read more: <https://www.ccn.com/indian-govt-think-tank-to-trial-blockchain-for-fertilizer-subsidy-payments/>

Blockchain / DLT

Fisheries

- Blockchain can be used to **track and deter illegal**, unreported and unregulated fishing (IUU)
- **WWF** is developing TraSeable, an application to stamp out illegal fishing and human rights abuse in the Pacific Islands' tuna industry.

Blockchain / DLT

Forestry, Environmental management

- In **China**, a company linked to Sichuan Province Administration aims to use blockchain for forestry economic development and rural poverty alleviation.
- In **Spain**, the Ministry of Agriculture, Fisheries and Food also plans to apply blockchain technology to develop the forestry industry (e.g. ChainWood).
- Companies such as Poseidon are developing blockchain-based systems to **track individual/company's carbon footprint** and then providing opportunities to offset it.
- IBM works with Veridium to **tokenize carbon credits** that are verified by third parties according to international standards.

Blockchain / DLT

Insurance

- Index insurance based on **smart contracts** can automate and greatly simplify the process thereby facilitating instant payouts to the insured in the case of adverse weather incidents.
- **Automatic data feeds** provide continuous and reliable hyperlocal data to the contract thereby eliminating the need for on-site claim assessment by the surveyor.

Blockchain / DLT

Insurance

How may this work?

- Agricultural insurance built on blockchain with **key weather incidents** and related payouts drafted on a **smart contract**, linked to **mobile wallets** with **weather data** being provided regularly by sensors in the field and correlated by data from proximity weather stations would facilitate immediate payout in the case of a drought or flooding in the field.

Blockchain / DLT

Land registrations

Blockchain-based implementations could provide an incorruptible ledger of **land records**

- UNDP in **India** is working with partners to make land registry more reliable by recording each transaction throughout the sale of a property.
- Land-ownership authority of **Sweden** has piloted land registry and property transaction on blockchain.
- **Georgia** is experimenting on the use of the bitcoin network to validate property-related government transactions.
- **Honduras** started as well in 2017, but the project collapsed

Blockchain / DLT

Issues and Opportunities in Agriculture

- Although the trend now is to try a blockchain-based implementation of traditional processes, in most cases this adds **unnecessary overheads** and does not yield any **tangible benefits**.
- Blockchain-based implementations still suffer from **traditional challenges**
 - Lack of or poor infrastructure, failures of interoperability, and other technology issues.

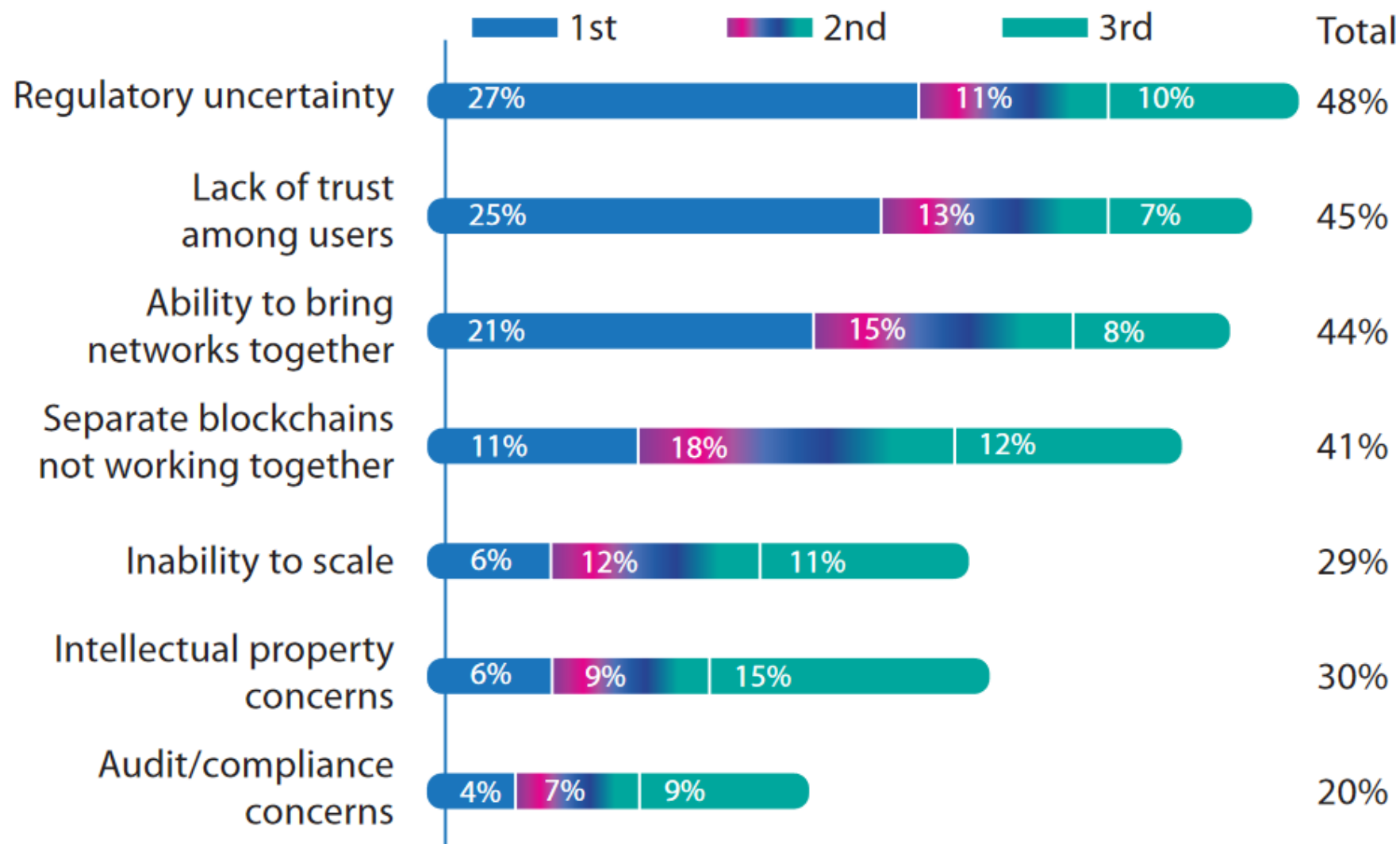
Blockchain / DLT

Key challenges

- Coping with the **complexity** of the technology and its implications
 - many variations: public/private, open/closed, types of ledgers
- Breaking the **chicken-and-egg problem**: stakeholders are often hesitant to participate in blockchain projects before the value is proven
- Connecting to existing databases and legacy system → **scalability**

Blockchain / DLT

Biggest barriers to adoption



PwC survey of 600 blockchain-savvy executives

Blockchain / DLT

Issues and Opportunities in Agriculture

- What it does promise is to deliver a **transparent, decentralized, secure transaction process** and may reduce transaction costs.
 - In agriculture, **self-executing smart contracts** together with automated payments would be the game changer.
 - The role of smart contracts especially in **agricultural insurance, green bonds, and traceability** could be very effective.

Blockchain / DLT

Issues and Opportunities in Agriculture

What's missing?

- To ensure the maximum efficacy for smart contracts, **frameworks** to support such an innovation, such as **high-quality data**, **enabling policies** and **regulations**, should be first addressed.
- The process of designing, verifying, implementing and enforcing smart contracts in traditional agricultural value chains is still a work in progress, with only a few pilot implementations to show **proof-of-concept**.

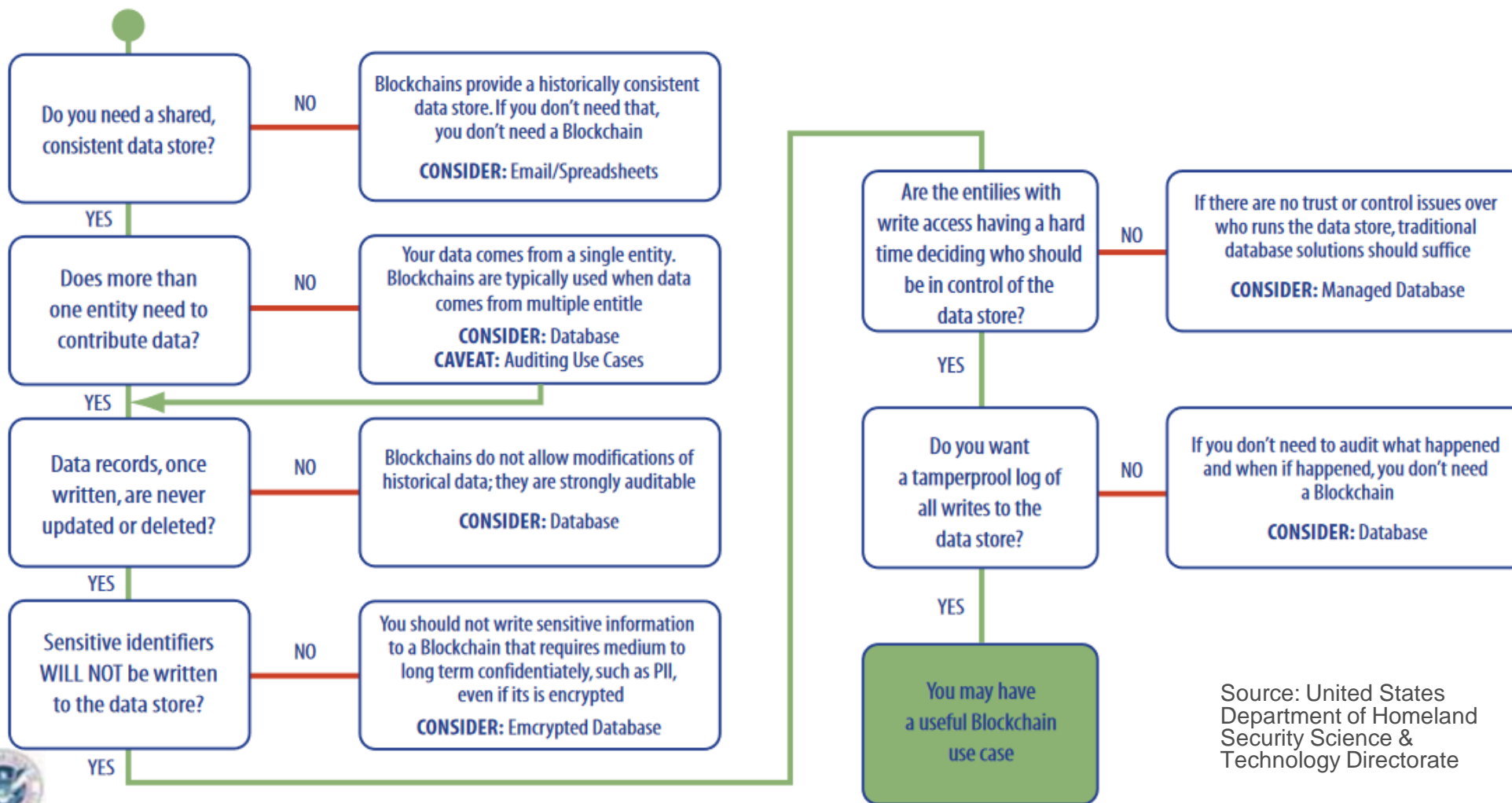
Blockchain / DLT

Best practices

- **Focus on the problem** to be addressed and the need for information in the ecosystem
- Engage end-users from the start of the project and identify the **minimum viable ecosystem** based on their commitment, urgency and position
- Take an **agile approach** to design and development, make mock-ups as soon as possible before building the software.
- Build upon '**Common Grounds**' (existing data infrastructure, data models, interfaces and standard messages)

Blockchain / DLT

When to use it?



Source: United States Department of Homeland Security Science & Technology Directorate



Blockchain / DLT

Conclusions

- Blockchain is a technology that is **not coming alone**: business ecosystems, governance and business models are its companions
- This combination **can be disruptive** in democratizing supply chains changing stakeholders' positions – usually not visible at the beginning
- Together with technical complexity makes Blockchain **not easy** to apply
- Hence, successful, large-scale **examples** in agri-food are **still rare**
- Start with a clear objective, a minimum viable ecosystem, then **step-by-step approach** based on common grounds



10 min

Question + Plenary Discussion

Question via Mentimeter and plenary discussion: opportunities and shortcomings of blockchain / DLT

Unmanned Aerial Vehicles (aka drones) in Agriculture

Deep Dive

What are UAVs?

- UAVs are unmanned aerial vehicles controlled from remote
- Many different uses: mapping, agriculture, forestry, military, deliveries, recreational etc...
- Many different technologies according to main user needs, e.g.: lifting capacity vs. distance, altitude, flight time...
- Drones can carry sensors conceptually similar to satellites and planes but can also carry tools and small machinery
- Light weight, limited cost, flexible technologies... But usage possibilities depend on local legislation

Multi-rotor vs. fixed wing

- **Multicopter:** high lift capacity, easier maneuvering, lower distances and shorter flight time
- **Fixed wing:** longer flight time, easier coverage of larger areas, more complex maneuvering
- **Combined type**



Digital sensors on drones

- Very high spatial resolution (5-10 cm vs. 50cm-1m of VHR satellite data), multi-spectral
- Conceptually close to aerial photography: oblique vision implies capacity of 3D imagery, advantage for applications where object height is needed (buildings, trees...)
- Can be used under clouds, less atmospheric noise, but geometry correction is important
- Opportunities for Crowd sourcing



Detecting change at the field level

- Sensor-equipped UAVs can collect multispectral images that are processed to generate spectral reflectance bands.
- Calculation of a variety of indexes
 - Normalized Difference Vegetation Index (NDVI)
 - Leaf Area Index (LAI)
 - Photochemical Reflectance Index (PRI)



→ Detection of crop changes or stress conditions otherwise invisible to the human eye.

Main applications of sensor equipped drones

- Precision agriculture, intra/inter-field variability
- Monitoring in areas with limited access (dense forest, water, flooded areas, mountains, fires...)
- High accuracy observations and mapping (e.g. post emergency mapping, used operationally by COPERNICUS for post-earthquake) and creation of orthomaps and digital elevation models
- Mapping/monitoring/data collection complementary to EO



Additional use cases

- Patrolling and detection [ranchers and fishery managers]
- Track livestock location conducting regular surveys of fencing [cattle ranchers]
- Improve farmers' creditworthiness by providing detailed and up-to-date farm data on location, size, crop quantity/quality
- Documentation of illegal land and resource use



Drones for agricultural production



Infra-red sensors monitor crops and detect pests/diseases 10 days earlier than the human eye



Rice crop fumigation by drone: 7 minute per ha
Rice crop fumigation by hands: 4-5 hours per ha

Drones for agricultural production



Sowing via drone can get to a 75% higher success rate of with a decrease in costs up to 85%.



Land use efficiency improved up to 10% for coffee production in Brazil

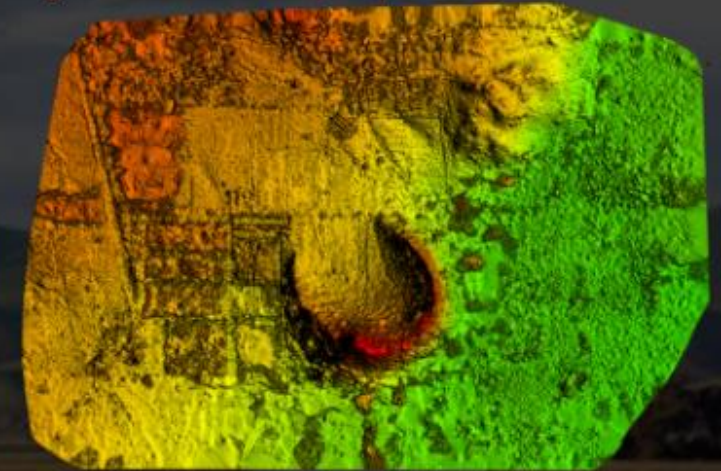
- Example of services offered by startup in Tanzania (UPANDE)

Drone Based Mapping And Inspection Services

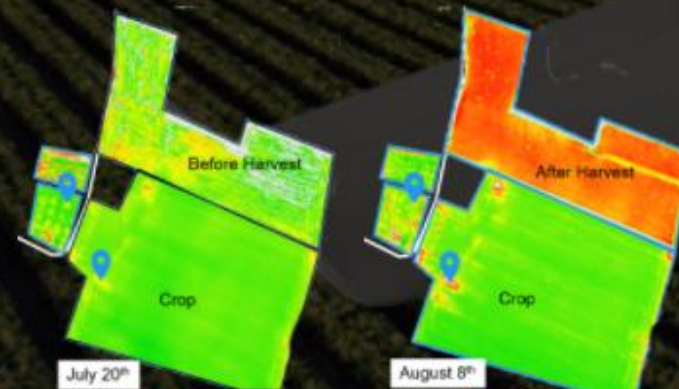
Orthophoto



Digital Elevation Model [DEM]



Monitoring Plant Health and Density



We provide drone based solutions to farmers, mining companies, government and environmental organizations. Drone products can be integrated with satellite based services, GIS data and sensor observations.

[VISIT UPANDE DRONES SITE](#)

Combining drones with satellite imagery for field campaigns (COPERNICUS4GEOGLAM project)

- Crop type mapping over large areas needs collection of ground information
- Drones can be used at different levels:
 - Replace VHR satellite imagery for assessing sample unit – Fixed wing
 - Surrogate to field survey for inaccessible location within sample unit – Multi-rotor
- Used for calibration / validation in combination with field data for wall-to-wall crop type mapping based on S1/S2



Drones for forestry

- Improve **forest management** and **operational planning**, including the monitoring of illegal activities and encroachment.
- Allow the **collection of key forest metrics** - e.g. tree canopy analysis, conservation features, tracking native species, carbon sequestration, monitoring biodiversity and ecological landscape features.
- Accurate and timely update of **forest inventory information** at local scale.
 - Adaptive planning, High project customization, and rapid implementation (even under challenging weather conditions).

Drones for forestry

The screenshot displays the explorer.land website interface. At the top left, the logo 'explorer.land' and a 'Back to all projects' button are visible. The top right navigation bar includes links for 'About', 'Blog', 'Help', and 'Feedback', along with a red 'APPLY FOR AN ACCOUNT' button and a 'Sign In' button. The main content area features a large photograph of a smiling man in a green shirt and a traditional hat, holding a wooden staff. Below the photo is a 'PROJECT' label and logos for 'COOPERATE' and 'RPL'. The project title is 'Food Forest Program: Carbon Offsetting with an Impact', followed by a list of partners: 'By CO₂ Operate B.V. · RPL · STKIP · Pemda Solok · Dishut Sumbar · Distan Sumbar · UNAND · UGM'. A navigation menu below the title includes 'ABOUT', 'NEWS', 'GOODS', 'SITES', and 'PARTNERS'. Further down, location and status information is provided: 'Indonesia, West Sumatra, West Timor', 'started 2009', and 'Active'. The categories listed are 'Agriculture, Agroforestry, Education, Conservation, Research, Restoration'. A 'Summary' section begins with the text: 'The Food Forest Program aims at restoring forest ecosystems on unused or degraded land while achieving three main objectives: poverty reduction,'. The right side of the screenshot shows a map of the project area with various locations marked with pins and numbers: Yefri Henri, Molon 2, Emiyati, Indra, Evil Saputra, Aliyonsyah, Sari Ameh 2, and several numbered sites (1, 2, 3, 5, 6, 11). The map is powered by Bing maps, as indicated at the bottom.

explorer.land is a map-based platform where project communication can be consolidated around maps



Relying on local networks to develop local capacities: the example of Flying Labs

- The goal of Flying Labs is to accelerate the positive impact of local aid, health, development and environmental solutions locally. Flying Labs also expand local markets by creating new jobs and businesses that offer robotics as a service and support local ecosystems.
- Network of 100+ local experts across 30+ countries in Africa, Asia and Latin America to build on existing expertise in drones, data and AI.
- Flying Labs are directly connected to each other, sharing lessons learned and best practices across the globe, training each other and working on joint projects.

Relying on local networks to develop local capacities: the example of Flying Labs



Main barriers to UAV use in agriculture & natural resources management

- Access to and capacity to use adequate software
- Legal aspects and regulatory regimes
- Acceptability from farmers
- Limited flight time and range
- High initial cost of purchase
- Connectivity (limiting data processing)
- Weather dependency

Supporting enabling regulatory systems

- Industry growing fast where enabling regulations are in place
 - Industry on hold or declining where regulations are too strict / disabling / expensive to comply with
- Regulators' decisions impact is multifold on security, privacy, and the possible transformation of agriculture into a data-driven profitable enterprise

The EASA 3-category approach [open/specific/certified] is the world's best practice

- Support its spread around the globe for national and international harmony and common standards.
- Streamline the regulatory process





10 min

Question + Plenary Discussion

Question via Mentimeter and plenary discussion on the value of UAVs



Break!

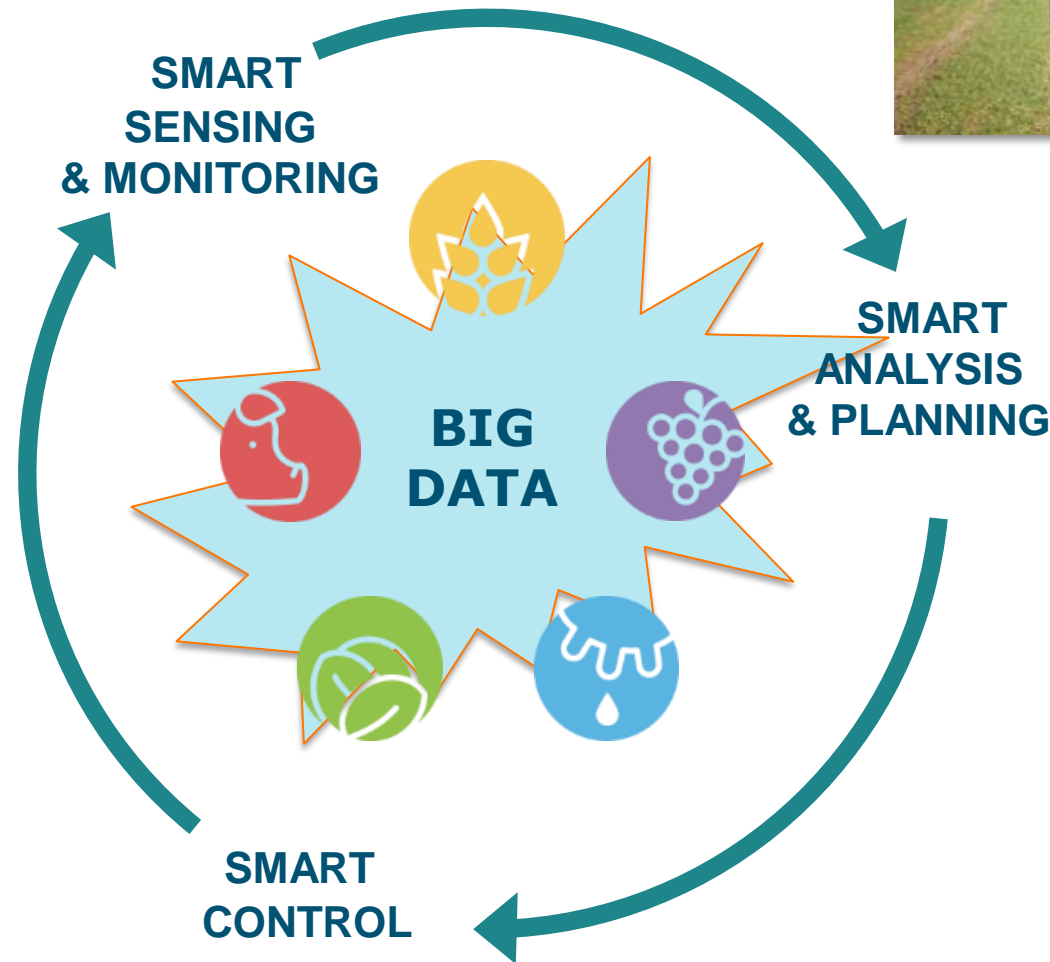
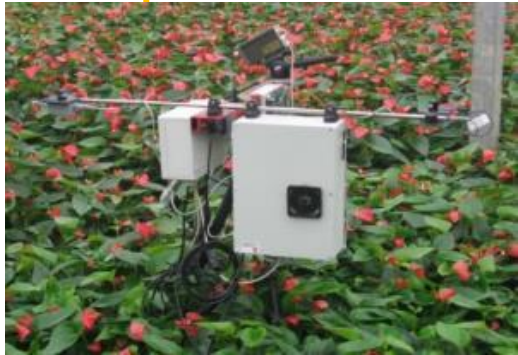


Big Data and Internet of Things (IoT) in Agriculture

Deep Dive

Sjaak Wolfert, 22 April 2021

Smart Farming



Involving entire supply chain and beyond



Smart Farming

Tracking & Tracing

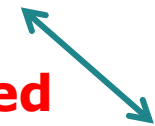
Smart Logistics



Consumer trends



Domotics



Health



Fitness/Well-being



Internet of Things (IoT)

Objects become a uniquely identifiable 'thing' real-time connected in a network

- Sensors
- Long Range communication
- Digital Twins



IoT + Big Data example: HAPPY COW



#70 is in estrus and can be inseminated.
Tuesday 23:00 - Yesterday 01:00

Cow appears to be in calving. She is showing increased milking activity.

STATUS	CLM	LAST FETUS	LACTATION
Inseminated	193	1 days ago	8

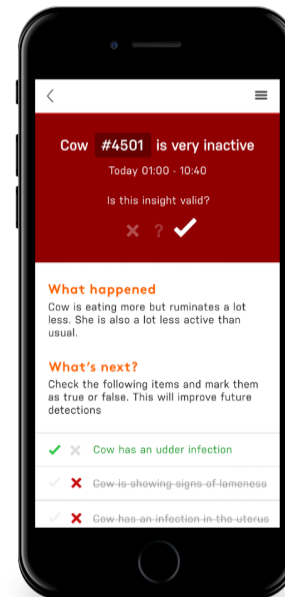
Have you inseminated this cow?

☑ ☒

< 04 Jan 2018 - 03 Feb 2018

1 day 1 week 1 month 6 months

Activity and Feed



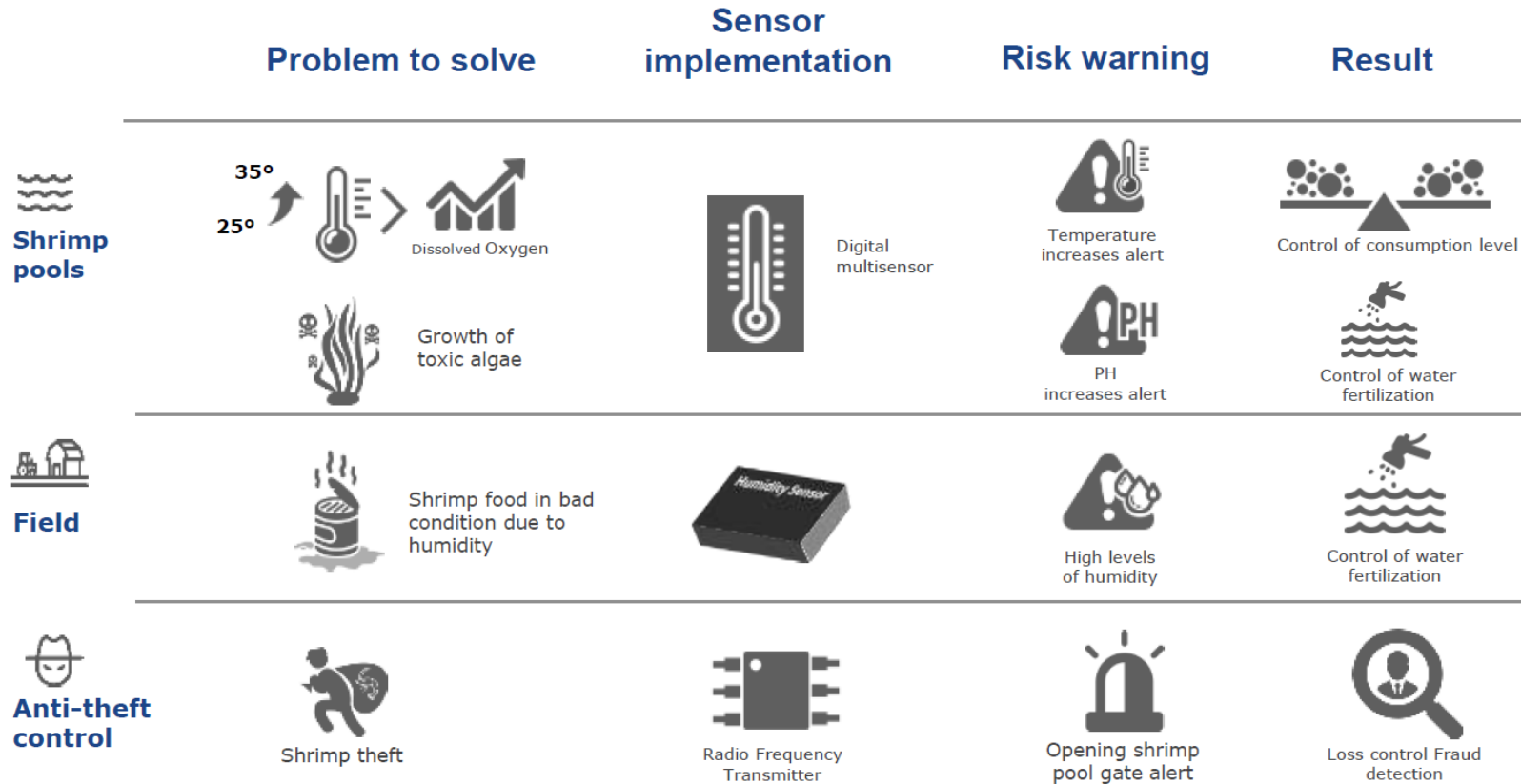
Insights

Ida works by understanding data and providing you with the key information to act on. Ida is constantly learning and as it learns more, new insights will start appearing in your timeline.

- Estrus**
 Over 93% accurate estrus detection together with best time to inseminate.
- Health**
 Ida detects cases of mastitis, lameness and 24-48 hours before they are critical.
- Feeding**
 Know which cows are having digestive disorders such as ketosis or are not ruminating for optimal efficiency.
- Heat Stress**
 Learn which cows are impacted by high temperatures and humidity more than other.
- Efficiency (available in beta)**
 Identify cows that are better suited to be bred for future generations.
- Calving (coming soon)**
 Know when a cow is expecting to calve and track the critical hours after calving for signs of distress.

Internet of Things

IoT & fisheries



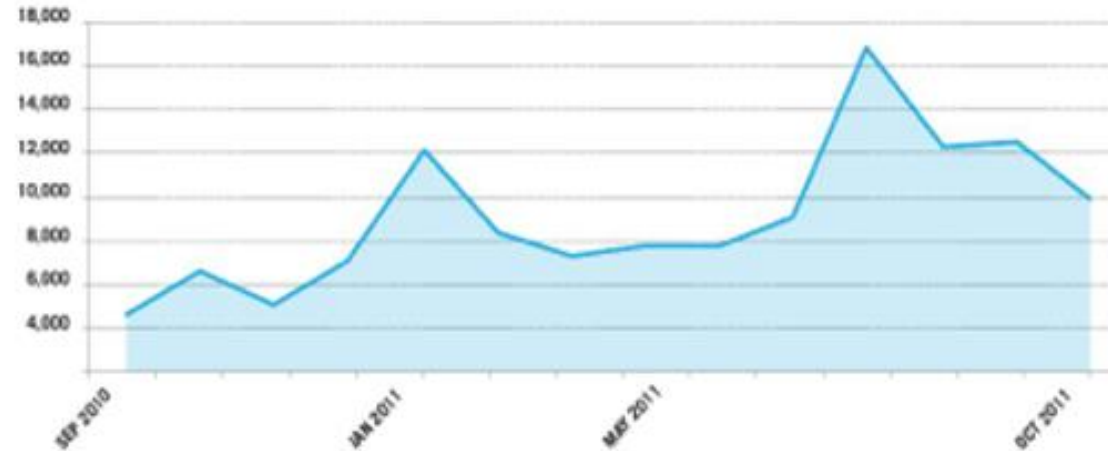
AzLogica, Colombia

Big Data

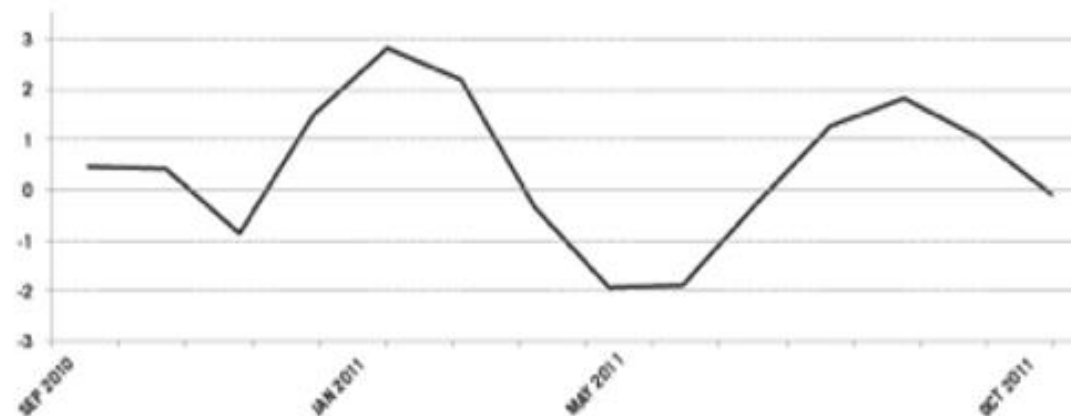
Making sense of data

But in combination with traditional research!


Tweets about the price of
rice
(per month)

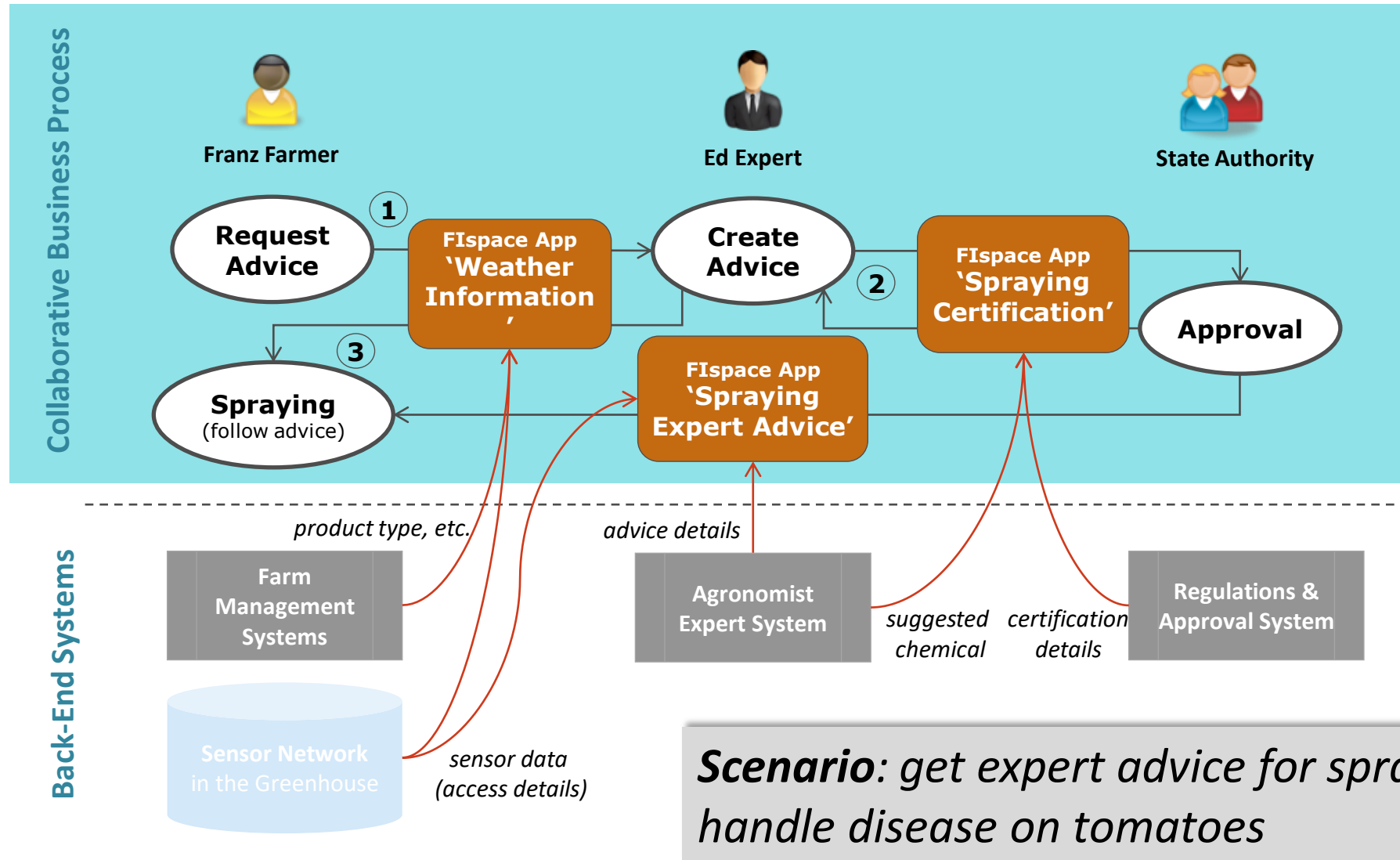



Food Price Inflation



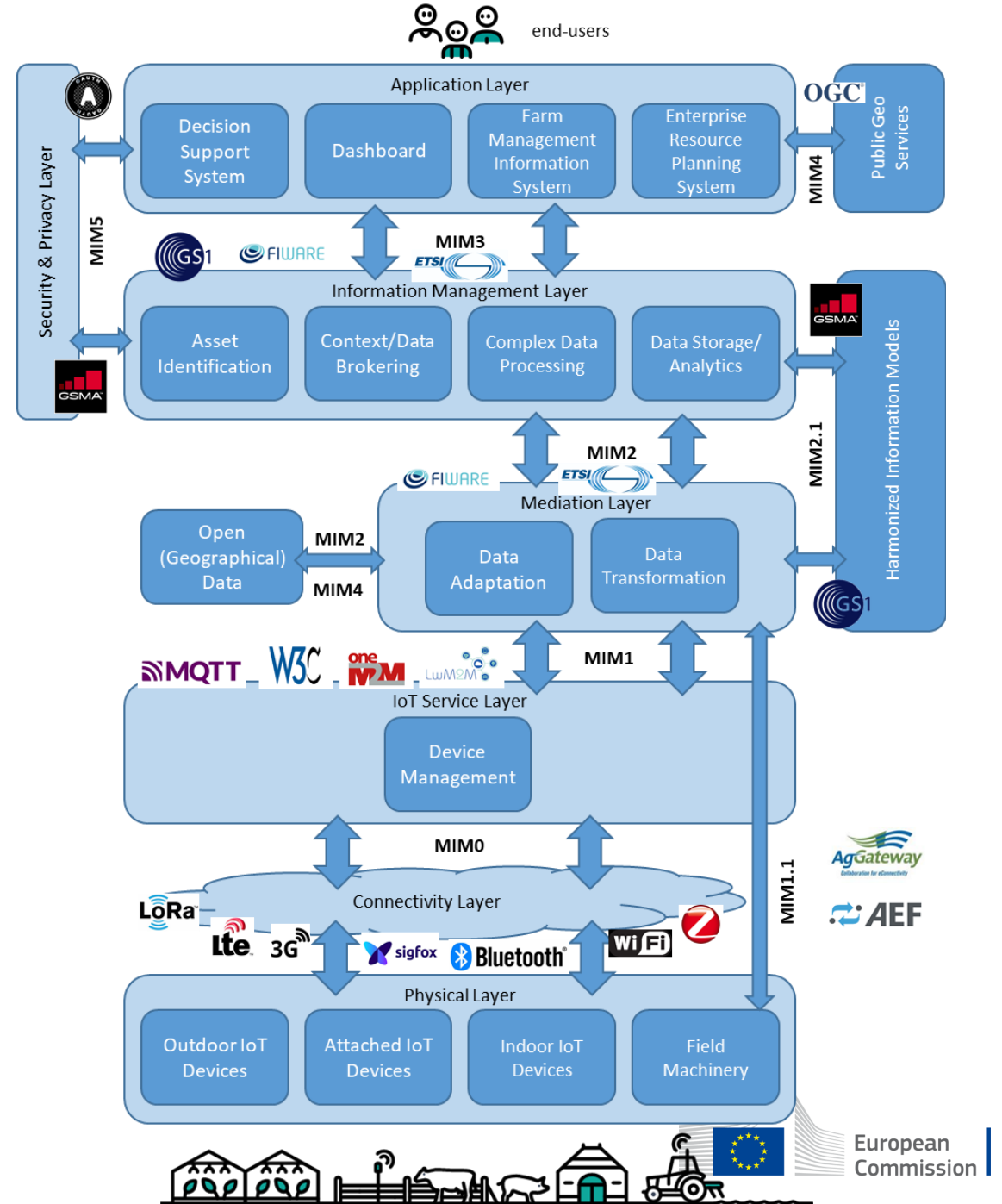
Jakarta, 2014

Creating a collaborative infrastructure



IoT Reference Architecture

- Use of standards
- Use of frameworks
 - E.g. FIWARE context broker
- Minimum Interoperability Mechanisms (MIMs)





IoT CATALOGUE

www.iot-catalogue.com



FARMER



TECHNOLOGY
PROVIDER

Use Case Explorer

The Use Case Explorer interface features a sidebar with filter categories: MEASUREMENTS, TAGS, DOMAIN, TARGET, PREDICT, and MONITOR. The TAGS filter is active, showing 'IoT2020' and 'WAZIUP'. Below the filters, the 'Chain-Integrated Greenhouse Production' use case is highlighted, with a brief description: 'IoT is about connecting systems so as to enable an integrated, multidimensional view of farming activities and allowing a deeper understanding of how ecosystems work. This is based on the extensive use of information and communication technologies (ICT) that involve large amounts of data, physical and virtual sensors, control loops, networks, models and optimisation techniques to improve both producer and consumer decisions. The chain-integrated greenhouse production use-case aims to develop a decision support system (DSS) for the greenhouse tomato supply chain based on IoT technology. Standardized information will increase interoperability along the production chain, with easier quality and safety management, improved products and processes and a lower environmental impact as the intended result.'

Use Case Detail

The Use Case Detail page for 'Chain-Integrated Greenhouse Production' includes a navigation bar with 'PRODUCTS', 'USE CASES', 'PROBLEMS', and 'MISC'. The main content area is divided into several sections:

- Problem:** Measure Weather Conditions, Measure solar radiation, Measure Air Quality, Improve Logistic and Packaging, Control and Identify Products, Improve Transport Conditions, Measure Temperature, Sense Presence.
- Domain:** Crop Growth, End User, Farmer, Logistic, Packaging.
- Function (1):** Measurements: Barcode, Barometric Pres..., CO2, Electrical Condu..., Electrical Consu..., Humidity, Location, Motion.
- Target (1):** Cooperative, End User, Outdoor Environment, Soil, Tomato Growing Crops, Truck.

A 'Solutions' section at the bottom displays six product cards:

- Arduino GPS tracking and temperature measurement:** Best price 163.50 €. Tags: Location, Temperature, +10.
- Arduino Water pump with relay:** Best price 32.72 €. Tags: Pumping, Actuator, +7.
- WAZIUP LoRa Weather Station:** Best price 190.00 €. Tags: WAZIUP, +27.
- SP-110: Self-Powered Pyranometer...:** Best price 72.78 €. Tags: Outdoor Environment, +4.
- Raspberry Pi 3 with camera...:** Best price 72.78 €. Tags: Tomato Growing Crops, +5.
- Leaf Wetness with Data Logging:** Best price 72.78 €. Tags: Tomato Growing Crops, Leaf Wetness, +5.

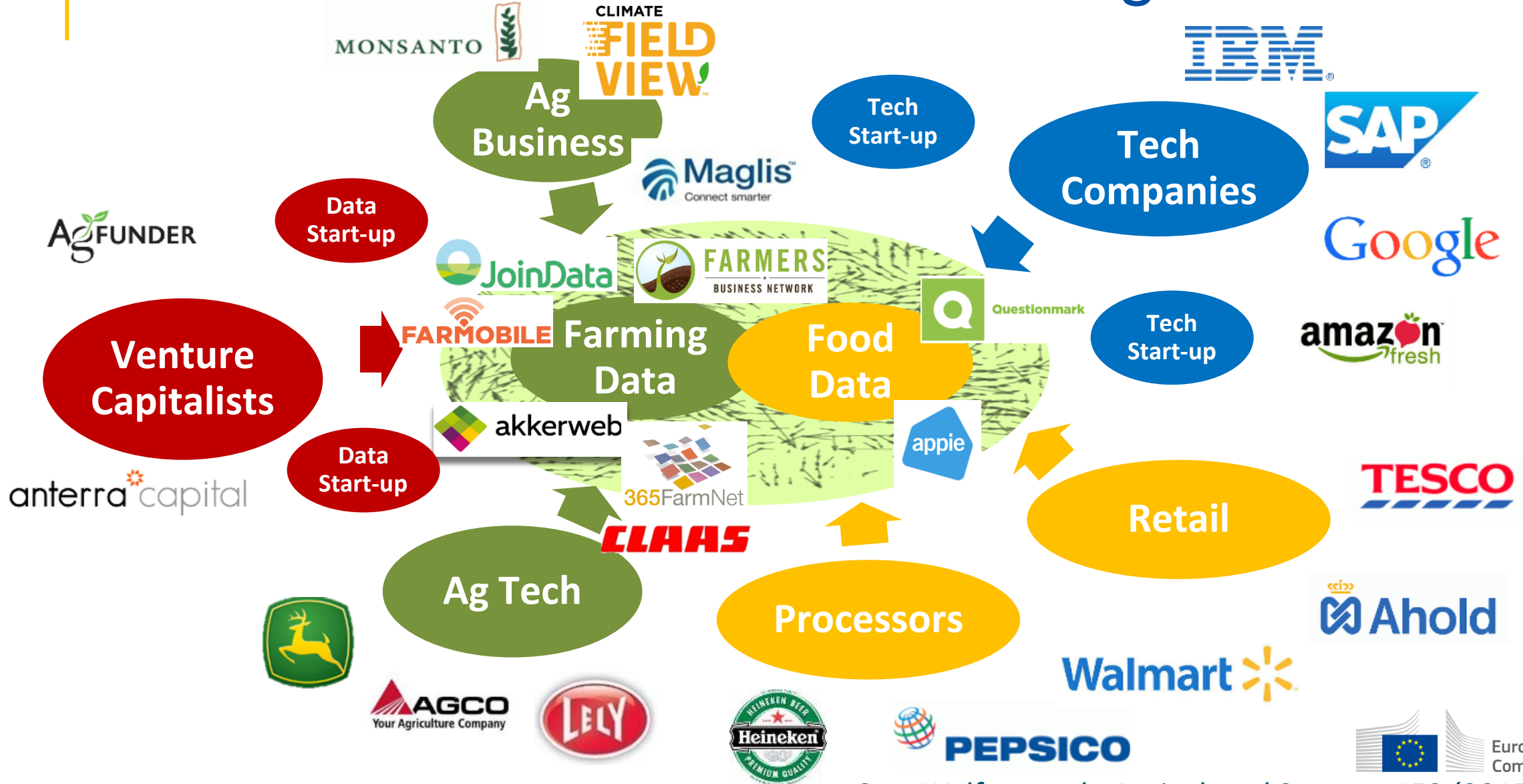
Products

The Products page displays a list of items for sale, including:

- Arduino GPS tracking and temperature measurement:** 163.50 € (Best Price), 1 Component, 23.00 € (Total Price).
- 4G-3G-GPRS-GSM Internal Antenna:** 8.00 € (Best Price), Last updated: 2 days ago.
- Arduino UNO:** 18.34 € (Best Price), Available in 7 stores, Last updated: 2 days ago.
- GPRS+GPS Quadband Module (SIM908):** 119.00 € (Best Price), Last updated: 2 days ago.
- Internal GPS Antenna:** 10.00 € (Best Price), Last updated: 2 days ago.
- Temperature Sensor Waterproof - DS18B20 (183cm):** 8.16 € (Best Price), Available in 4 stores, Last updated: 2 days ago.

The page also includes a '5 Components' section and a 'Used on' section showing the 'Chain-Integrated Greenhouse Production' use case.

The Battlefield of Data for Farming and Food



AG TECH: 100+ TECHNOLOGY COMPANIES CHANGING THE FARM

FARM MANAGEMENT SOFTWARE



PRECISION AGRICULTURE AND PREDICTIVE ANALYTICS



NEXT GEN FARMS



MARKETPLACES



ANIMAL DATA



ROBOTICS AND DRONES



SMART IRRIGATION



PLANT DATA/ANALYSIS



SENSORS



Business Model patterns in data-driven innovations

- Basic data sales
- Product innovation
- Commodity swap
- Value net creation
- Value chain integration

Source: Arent van 't Spijker: "The New Oil - using innovative business models to turn data into profit", 2014



Basic data sales

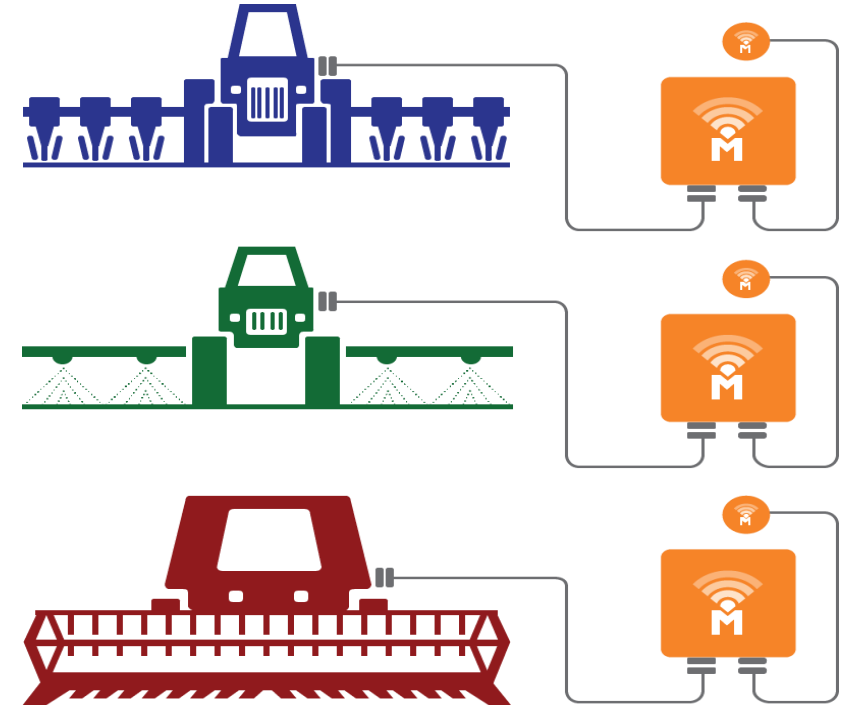


“Farmers think their trust is violated”

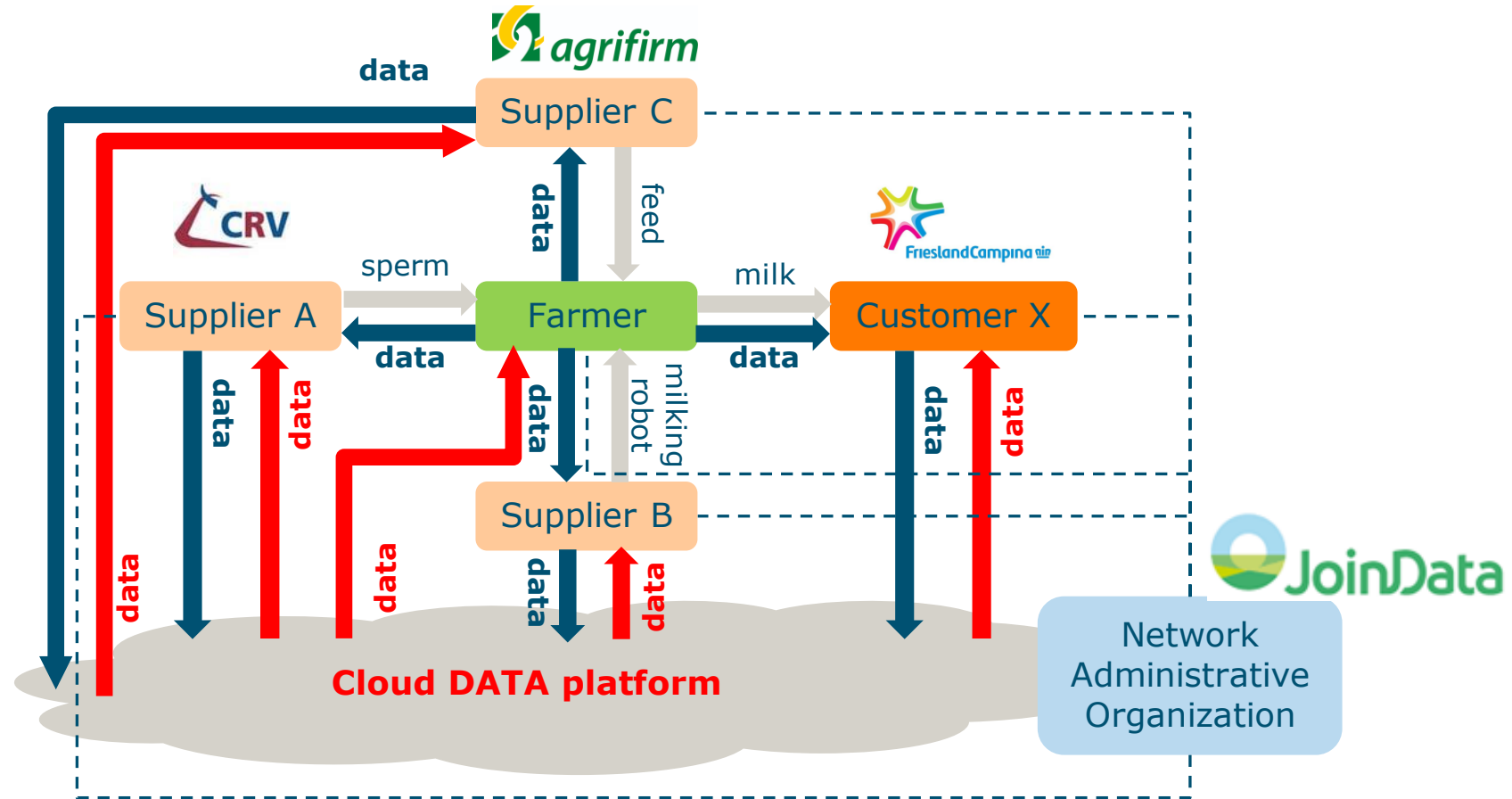
Their data goes to multinationals that promise high future yields based on big data, while farmers have to pay for everything

How does it work?

- A ‘box’ collects all data
- Data is stored in a cloud
- Data is being marketed/invested
- Farmer gets a share of profit



Value net creation with data



Key challenges for IoT & Big Data development

How to create **infrastructures** and **ecosystems** that utilize the **potential of IoT & Big Data** to address the **grand challenges** of sustainable food production?

→ Integrated approach:

- Data Infrastructure & Analytics
- Business models
- Governance





10 min

Question + Plenary Discussion

*Question via Mentimeter and plenary discussion on the key enablers of
Big Data*

Development of a digital agriculture strategy

Key approaches and entry points

Engaging with D4ag partners/initiatives

Key Criteria

Cluster	Criteria	Value
General criteria	To be satisfied to engage	Yes/No
Benefit	General benefits for the organization, the partners, the beneficiaries	High (+3) Medium (+2) Low (+1)
Enabling factors	Factors enabling success of the D4ag initiative	
Organizational Impact	Impact on the organization	
Cost	General and recurring costs	High (-3) Medium (-2) Low (-1)
Risks	Risks associated with the initiative	

Engaging with D4ag partners/initiatives

Key Criteria

Cluster	Criteria
General criteria	<ul style="list-style-type: none">• Compliance with DG INTPA strategies and rules• Compliance with Digital Development Principles• Compliance with EU policies and rules

If satisfied, assessment can proceed...



Engaging with D4ag partners/initiatives

Key Criteria

Cluster	Criteria
Benefit (general)	<ul style="list-style-type: none">• Overall benefit for partners and beneficiaries• Meeting the needs and expectations of staff, partners, or beneficiaries• Contribution to DG INTPA strategies
Enabling factors	<ul style="list-style-type: none">• Availability of skills and capacities among staff, partners, or beneficiaries• Availability of technologies and infrastructure• Buy-in of staff, partners, or beneficiaries• Existing evidence of impact• Overall appropriateness of the technology for the target community
Organizational Impact	<ul style="list-style-type: none">• Organizational learning• Improvement of external relations• Strengthened innovation culture• Strengthened positioning and branding

Positive factors

Engaging with D4ag partners/initiatives

Key Criteria

Cluster	Criteria
Cost	<ul style="list-style-type: none">• Environmental and social costs• Resources needed to implement the initiative• Recurrent expenditures required for maintenance sustainability
Risks	<ul style="list-style-type: none">• Financial risks• Implementation risks• Exploitation risks• Partnership risks• Reputational risks• Technology risks

Negative factors

Various approaches & methodologies

- **CTA's library** lists publications in the area of D4Agriculture: data, youth engagement, blockchain
- **FAO** pioneered the **Communication for Development** approach to support the inclusive design and implementation of rural communication strategies combining digital technologies and traditional media
- **FAO & ITU** prepared a guide to develop **e-Agriculture strategies** to help countries identifying and developing sustainable digital services and solutions for the agriculture sector
- **GSMA** developed a toolkit to design **mobile services** in agriculture
- **IFAD** published a toolkit to design digital financial services for smallholders

GSMA

mAgri Design Toolkit

The mAgri Design Toolkit is a collection of instructions, tools, and stories to help develop and scale mobile agriculture products by applying a user-centered design approach.



A set of six modules

GSMA

mAgri Design Toolkit

- 1. Introduction:** what is user-centered design and how does it bring value to mAgri?
- 2. Planning:** align on team setup, existing knowledge, and assumptions.
- 3. Learning:** create meaningful products, you need to be closer to user, market, and context of use.
- 4. Create:** develop a mAgri concept that is deeply rooted in insights captured in the field
- 5. Develop:** shift from concept to realization: prioritize features and plan how to create value, deliver, and capture it over time.
- 6. Maintain:** When the product launches, continuously gather feedback from farmers and the ecosystem to refine and improve the product.

ITU & FAO

e-Agriculture strategy guide

- This framework assist countries to develop their national e-agriculture strategy and master plan.
- An e-agriculture strategy comprises 3 parts:

Part 1: Establishing a national e-agriculture vision

Part 2: Developing a national e-agriculture action plan

Part 3: Monitoring and evaluating implementation of the strategy

ITU & FAO e-Agriculture strategy guide



ITU & FAO

e-Agriculture strategy guide

- 1 Research agriculture sector growth and demographics;
- 2 Describe the existing agricultural extension systems;
- 3 Describe the existing agricultural services, information flow and transaction streams in agricultural value chains;
- 4 Review the national agricultural strategy, goals and priorities;
- 5 Identify socio-economic development goals relevant to e-agriculture;
- 6 Identify work already done on strategies for e-agriculture;
- 7 Identify goals and challenges where e-agriculture will have the most impact;
- 8 Describe how e-agriculture will support selected goals.

Case example

Digital Transformation of agriculture in Guatemala

- Exploratory work as part of a program supported by the EU Delegation
 - Mapping of existing information system used by the Ministry
 - National event to kick off the Digital Transformation of the agriculture sector in Guatemala
 - Workshop with experts from public/private sector on thematic areas to identify key priorities, opportunities, threats
 - Design of pilot initiatives (e.g. creation of a national registry of beneficiaries)

PRENSA LIBRE Guatemala Ciudades Deportes Internacional Economía Vida Opinión

El Maga quiere saber cuántas aplicaciones tecnológicas agrícolas hay en Guatemala

Un proyecto para identificar, ordenar y promover el desarrollo y uso de sistemas y aplicaciones tecnológicas en la agricultura lanzó el Ministerio de Agricultura, Ganadería y Alimentación (Maga) con apoyo de la Unión Europea (UE).

Por Rosa María Bolaños

11 de diciembre de 2019 a las 5:12h

★ Archivado en:

► agricultura ► Aplicaciones Tecnológicas ► Maga ► Unión Europea



Case example

Development of an Action Plan for Digital Agriculture in Sri Lanka

- Support to D4Ag as part of the TAMAP project
 - Assessment of the use of D4Ag services by stakeholders across the country through workshops
 - Analysis of supply/demand dynamics of D4Ag services in SL
 - Training of farmers and other stakeholders in the use of existing applications
 - Development of an action plan related to further roll-out of D4Ag in SL
 - Assist selected local D4Ag startups in the preparation of bankable business plans

Digitalisation Toolkit

- [Introduction](#)
- [Policy and regulation](#)
- [Copernicus](#)
- eGovernance
- Entrepreneurship
- VET for professionals
- eAgriculture
- Big data and AI
- Connectivity & Digital Infrastructure
- Smart Cities
- Digital & Gender
- Digital & Energy
- Digital & Education
- Digital financial services/inclusion
- Self-learning: digitalisation: where to go
- Cybersecurity /Trust&Security/Diplomacy
- Digital & Health

Capacity4Dev : Digitalisation 4 Development

Digitalisation 4 Development

- Home
- Highlights
- Wiki
- Library
- Discussions
- Media
- Events
- Members

Quick post (Discussion)

Share information or an idea, start debate or ask a question here...

Latest activity

Digital for Women

W [Francesco STELLA](#) created a new WIKI page | 6 days ago

Digital4Women: how to enable women empowerment in Africa through mainstreaming digital technologies and services in EU development programmes Since the end of the 20th century, lives and societies have increasingly become digitalised with internet, digital technologies and tools as drivers for...

👍 0 💬 0 👁 26

Infosheet 3 - Copernicus

W [Francesco STELLA](#) created a new WIKI page | 1 week ago

Toolkit Infosheet 3 - Copernicus DIGITALISATION FOR DEVELOPMENT. A TOOLKIT FOR DEVELOPMENT COOPERATION PRACTITIONERS INTERNATIONAL PARTNERSHIPS What is Copernicus? Satellite observations, including imagery and other data can provide key information for a number of areas in which the EU is involved...

Search in group...

- Edit membership
- Invite a member
- Notifications are enabled (disable)



About the group

Sharing information on Digital for Development

👍 Recommend

Group created on 25 July 2019

Share

D4D Hub

Key actions

- Creation of the “African Union - European Union [D4D Hub](#)” - based on the recommendations of the [EU-AU Digital Economy Task Force Report](#)
- Launch of a series of African-European multi-stakeholder initiatives, boosting the rollout of the African Union's own [Digital Transformation Strategy](#)
- Operationalise the Team Europe approach in digital transformation, positioning the EU with its human-centric digital economy model on the world's digital map.
- EC and BMZ organized the [Smart Development Hack](#) (April 2020), gathering 1000+ innovative digital solutions to help facing the COVID19 emergency

Developing Digitalisation Initiatives

Engaging Private Sector

- Main instrument is the **EFSD+** (European Fund for Sustainable Development Plus) through the banks to establish venture capitals
- Support the development of a conducive business environment through **Technical Assistance** and **digital governance programmes**.
- Action through the D4D Hub – a coordination platform with EU MS and private sector
 - Focal point in F5 for agriculture/green and digital: Ms. PIROLI Milena (INTPA)
Milena.PIROLI@ec.europa.eu
 - Contact: BARONE Barbara (INTPA) <Barbara.BARONE@ec.europa.eu>;
MACOVEI Georgiana (INTPA) Georgiana.MACOVEI@ec.europa.eu

Q&A + Wrap-up of the course

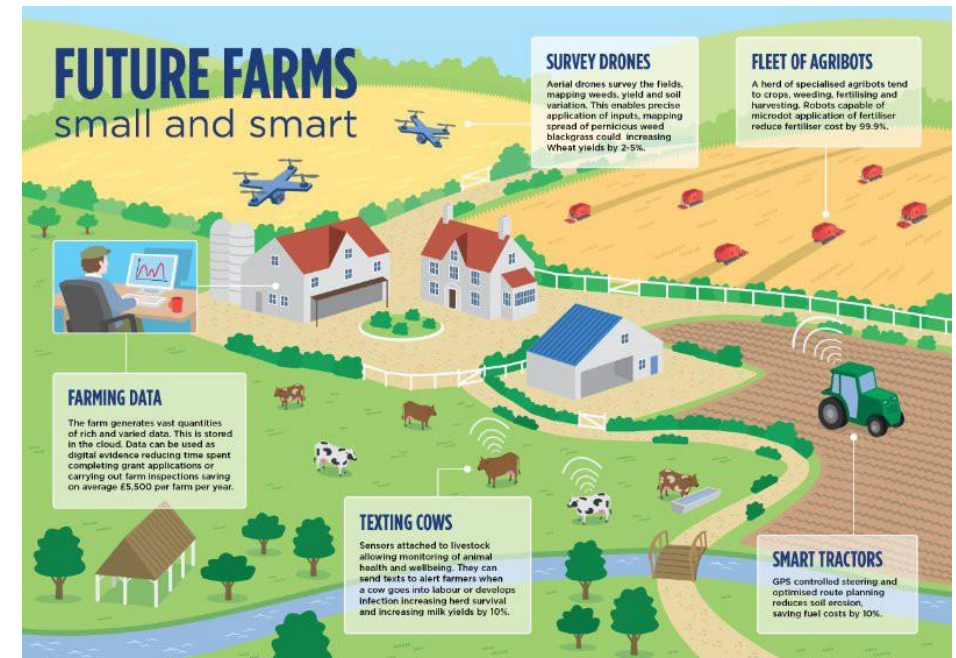
Q&A

- Any questions? Comments? Remarks?

Q&A + Wrap-up of the course

Wrap-up

1. Digital Transformation of the world is happening at a fast pace, development and agriculture being part of that
2. Various EU policies are relevant to leverage digital tech for development cooperation and agriculture
3. Digital tech is transforming some key subsectors of agriculture (financial inclusion, agricultural production, advisory services, etc.)
4. Various digital technologies are being applied to transform agriculture
 - Particular stress on Earth Observation technology - powered by Copernicus and the EU!
5. Different approaches, methodologies, guidelines available - need to be tailored to the context of our partners





5 min

Course evaluation

- Please fill the form: your feedback is important! 😊

Thank you!

Contact: simone.sala@gmail.com



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Slide 7: video, source: Centre for International Governance Innovation; Slide 14: picture, source: Gary Stevens, Hosting Canada; Slide 25: pictures, source: Broadband Commission; Slide 26: pictures, source: McKinsey Global Institute; Slide 27: pictures, source: Deutsche Welle; Slide 49, 52: picture, source: ITU, Measuring digital development (2019); Slide 50, 53: picture, source: GSMA, Mobile Internet Connectivity 2020; Slide 55: picture, source: GSMA, The Mobile Gender Gap Report 2020; Slide 59: picture, source: Mike McGregor, <http://www.mikemcgregor.com>; Slide 65: picture, source: Bloomberg; Slide 68: picture, source: Kenya Open Data; Slide 72: picture, source: the Engine Room

