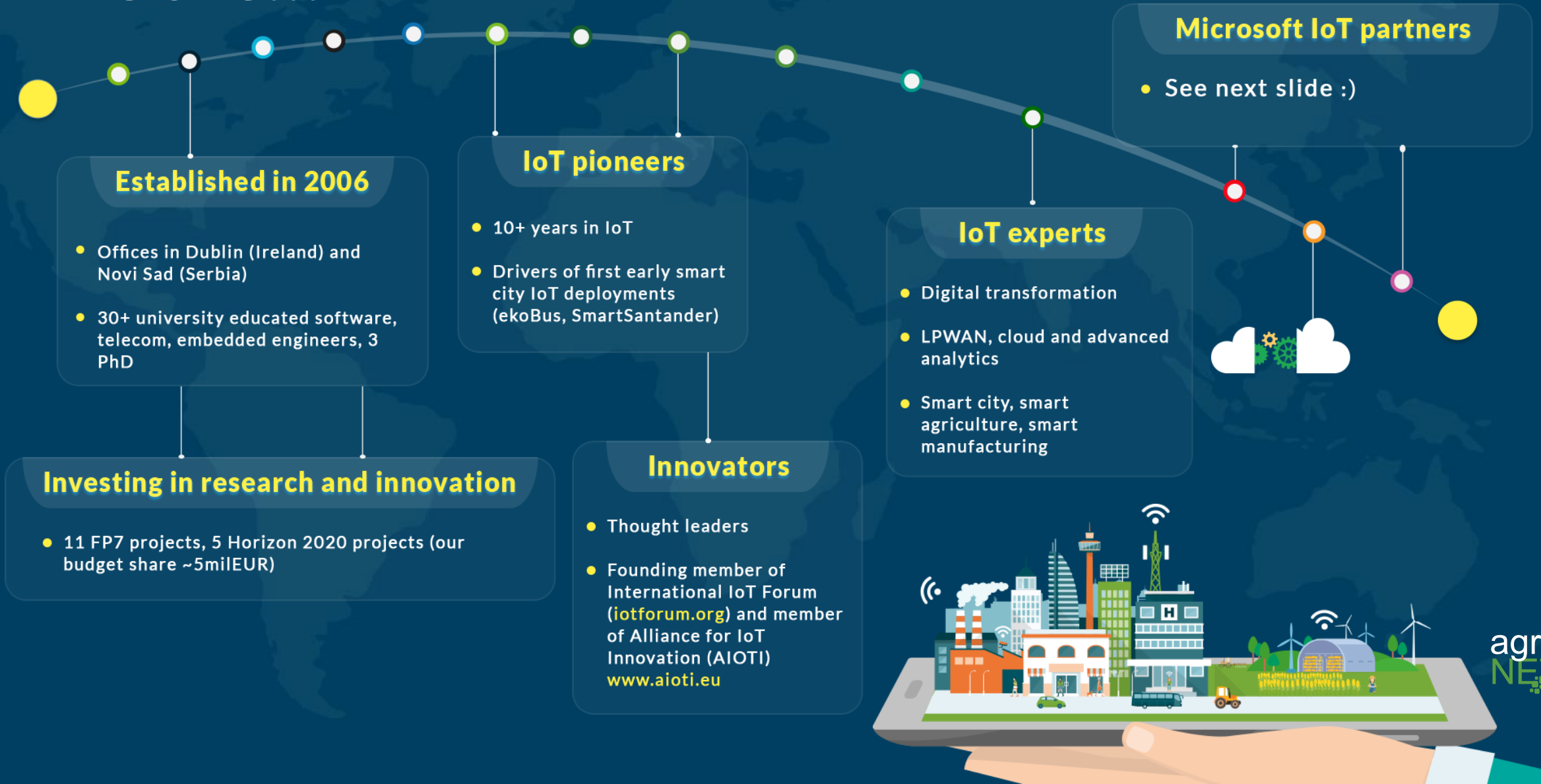




**DunavNET**  
**Packaged IoT solutions,  
as a Service**

# We are...



# Microsoft IoT is already delivering tangible results across industries

## FINNING

"Finning's IoT solution has enabled customers to quickly solve business problems from a dashboard, transport more than 1 million additional tons of cargo via machine learning, reduce fuel consumption by reducing idling by 17%, and increase ROI and competitiveness for the long term."



Tetra Pak's IoT business results show down-time cut down by up to 48 hours for each packaging line saving up to 30,000 Euros for customers."



**Rolls-Royce**

Cutting fuel usage by 1 percent could save **\$250,000 per plane per year**



Chillers restart **9x faster** than unconnected equipment, avoiding more than **\$300,000** in hourly downtime costs

## HERSHEY'S

Ensure the licorice extruders on Twizzler's production line are **performing at peak optimization, saving over \$500K/year** on licorice alone.



By analyzing driving trends on its own patrol fleet, RAC has **reduced its accident rate by 25%**, and **reduced fuel usage by 20%** - reporting annual savings of **\$1.8 million**



By telling farmers such things as when to irrigate, how to control diseases and where to fight pests, agroNET provides an action plan to maximize efficiency. This solution has seen yield increases of 30% due to data & machine learning informed irrigation decisions and reductions in water use by 20%."

## Rockwell Automation

Improves access to production and supply chain **data** worldwide, reducing downtime costs by as much as **\$300,000 per day**



**thyssenkrupp**

Gathers data from sensors and systems to create valuable business intelligence and **reduce downtime by 50%**

Microsoft Ignite: <https://www.microsoft.com/en-us/ignite/default.aspx>

# DunavNET's vision...

Creating fully packaged, turnkey, repeatable IoT solutions for multiple domains to enable service providers to effortlessly offer them to end users.

# DunavNET's ambition...

To be one of the best  
global IoT companies.

# Digitally transform or die...

Digitalization changes how business of tomorrow will run.

Capabilities lag behind possibilities and needs.

New business models

Improved customer experience

Optimized business processes

Technology is changing faster than IT skills of companies.

Opportunities being lost.

# We put everything together...

Identify  
business  
challenge

From “we want to buy IoT, 2 kilos of IoT 😊” to very clearly identified needs and ideas, co-creating with stakeholders

Fast design  
and  
prototyping

Leverage our ecosystem, internal and external experts, IoT technology, data analytics and domain expertise to design solutions

Design and  
implement  
minimum  
viable product

Leverage our ecosystem and **reusable building blocks** to create a working solution (MVP) in 3 months

...and create turnkey IoT solutions

One platform  
multiple, packaged, IoT solutions.

Partner based design, development,  
deployment and provision



## FARM

MANAGEMENT DASHBOARD



### VINEYARD/ORCHARD/ ARABLE CROPS DASHBOARD

OPTIMIZED  
IRRIGATION

DISEASE  
PREDICTION

ASSET  
TRACKING

MACHINERY  
MONITORING

INSECT  
MONITORING

SATELLITE  
IMAGES

SILLO'  
MONITORING

### POULTRY FARM DASHBOARD

BIOSAFETY

FOOD MIXTURE  
OPTIMIZATION

CALCULATOR

ENVIRONMENT  
CONDITIONS

DIGITAL  
ASSISTANT

ANIMAL HEALTH  
AND WELLNESS

## SUPPLY CHAIN

MANAGEMENT DASHBOARD



### SUPPLY CHAIN DASHBOARD

GS-1 IDENTITIES

TRACEABILITY

VALUE ADDED  
SERVICES

## SMART CITY

SOLUTIONS



ASSET  
TRACKING  
VEHICLE/FLEET  
TRACKING

AIR QUALITY  
MONITORING

NOISE  
MONITORING

WASTE  
COLLECTION  
OPTIMIZATION

PARKING  
MANAGEMENT

## MANUFACTURING



BOTTLE  
LABELLING  
PROCESS  
OPTIMIZATION



API

Slice, dice, assemble, wrap, deliver...

## DOMAIN SPECIFIC DATA ANALYTICS MODULES

SOIL &  
CROP  
MODELS

PEST AND  
DISEASE  
PREDICTION  
MODELS

IMAGE  
ANALYSIS

MACHINERY  
INCIDENT  
DETECTION

PRODUCT  
PASSPORT

TRANSPORT AND  
STORAGE  
CONDITIONS  
MONITORING

COUNTY-LEVEL  
DETECTION

POULTRY  
MODELS

THIRD PARTY  
SERVICES

DRIVER  
BEHAVIOUR

POI  
ROUTING

INCIDENT  
DETECTION

GLUE  
CONSUMPTION



DIGITAL  
TWINS

EVENT  
PROCESSING

PERMANENT  
STORAGE

VISUALIZATION

USER  
MANAGEMENT

NOTIFICATIONS

BLOCKCHAIN  
CONNECTOR

## CORE/GENERIC DNET COMPONENTS



Microsoft Azure



# Business model: SaaS, B2B2C

Turnkey, ready to provision services with included support, collateral, training

Setup fee + annual subscription per end user/device

Private label option

# We work with...

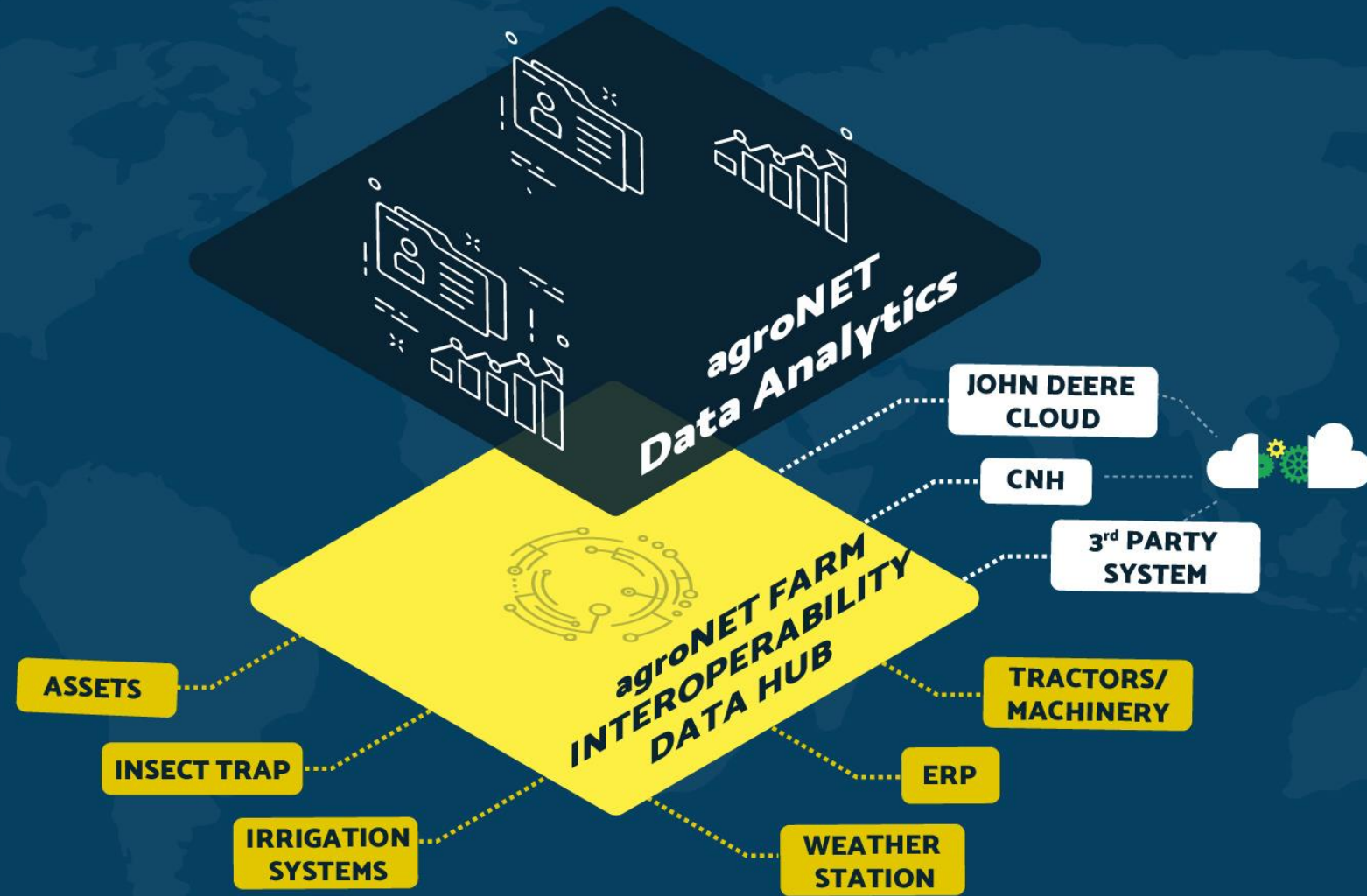
- Mobile operators and service providers
- Manufacturers looking to provide connected devices
- Companies starting digital transformation

# Reaching global audience...

- Own business development
- Participation in EU collaborative initiatives and associations
- International trade exhibitions
- Through MSFT channels (co-sell initiative and partners)

# Ecosystem

- HW vendors (sensors, gateways)
- Communication providers (mobile operators, LoRa network operators,...)
- Domain experts
- System integrators and field technicians
- Sales channel partners
- Microsoft





AgroNET

portal.v2.agronet.solutions

Weather forecastEnglishdemodnet

×

Irrigation

Smart trap

Prediction models

Satellite images

Poultrynet

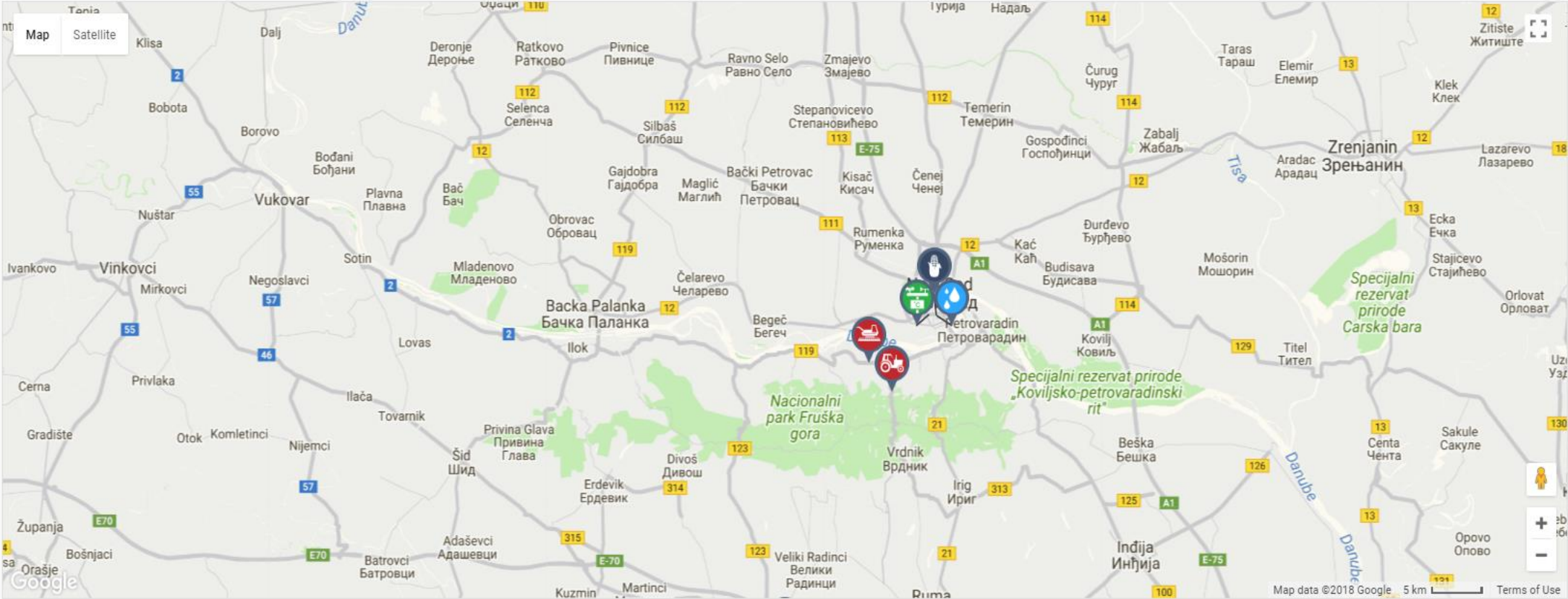
FleetNet



activityBook

TAG IT SMART

DUNAV NET

MapSatellite



Device name	Notification
 City Test	Irrigate with 5l of water per m2. Soil moisture: 15.9% . Threshold for the field: 16.9%. Expected p...
 RHMZ Novi Sad	There is a possibility of infection.

AgroNET assistant

AgroNET

portal.v2.agronet.solutions

Weather forecastEnglishdemodnet

×

Irrigation

Smart trap

Prediction models

Satellite images

Poultrynet

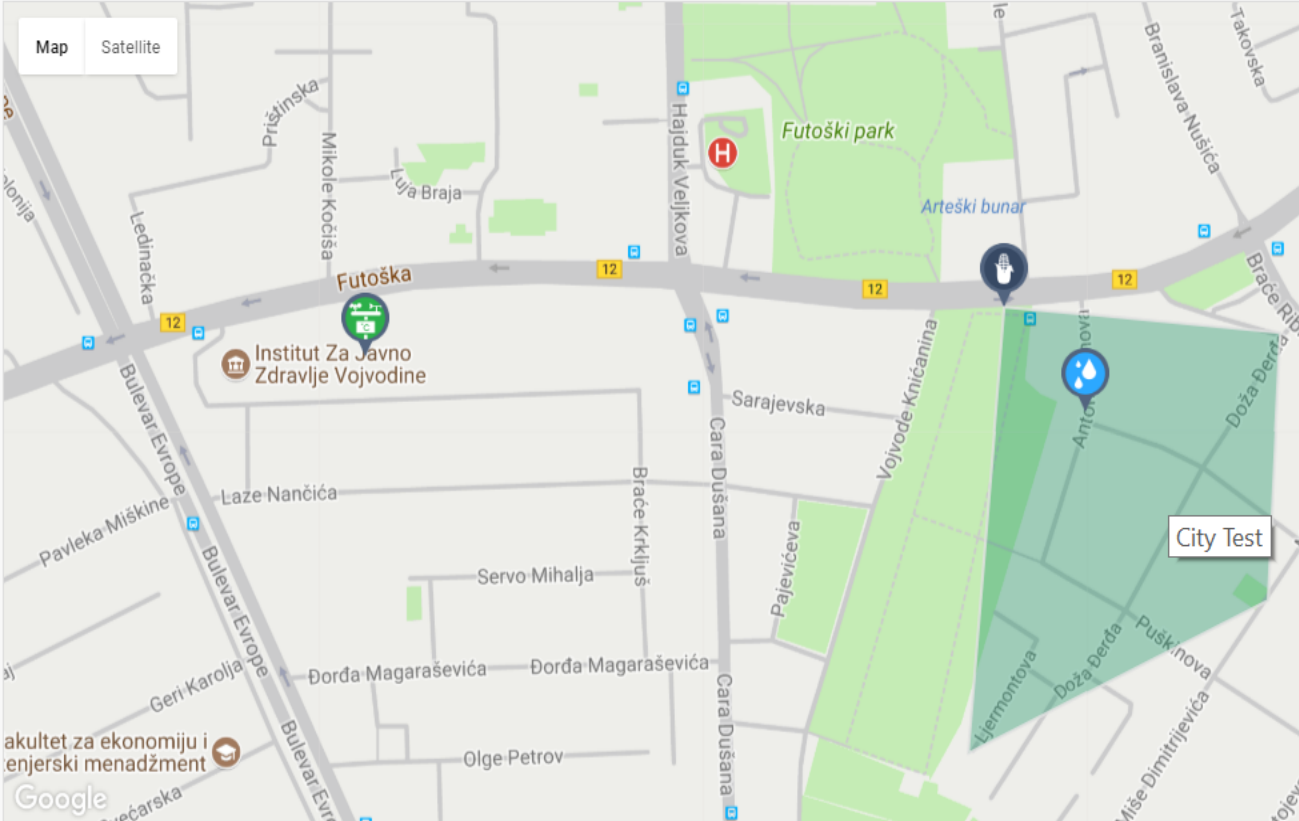
FleetNet

activityBook

TAG IT SMART

DUNAV NET

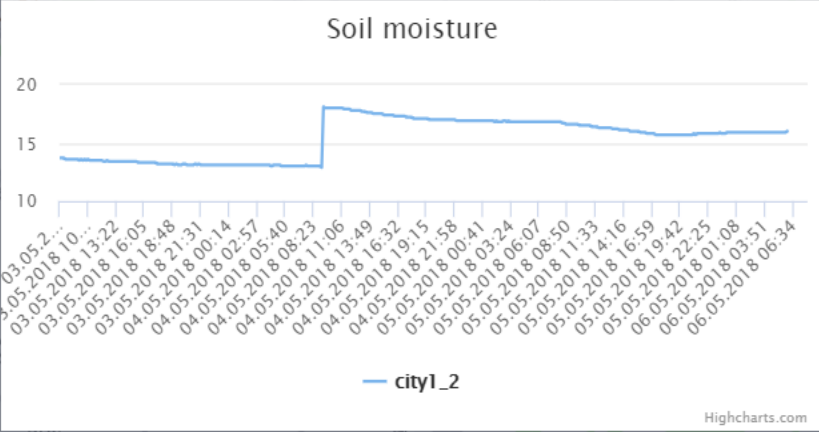
MapSatellite



City Test

5/6/2018 4:00:01 AM

Soil moisture



city1\_2

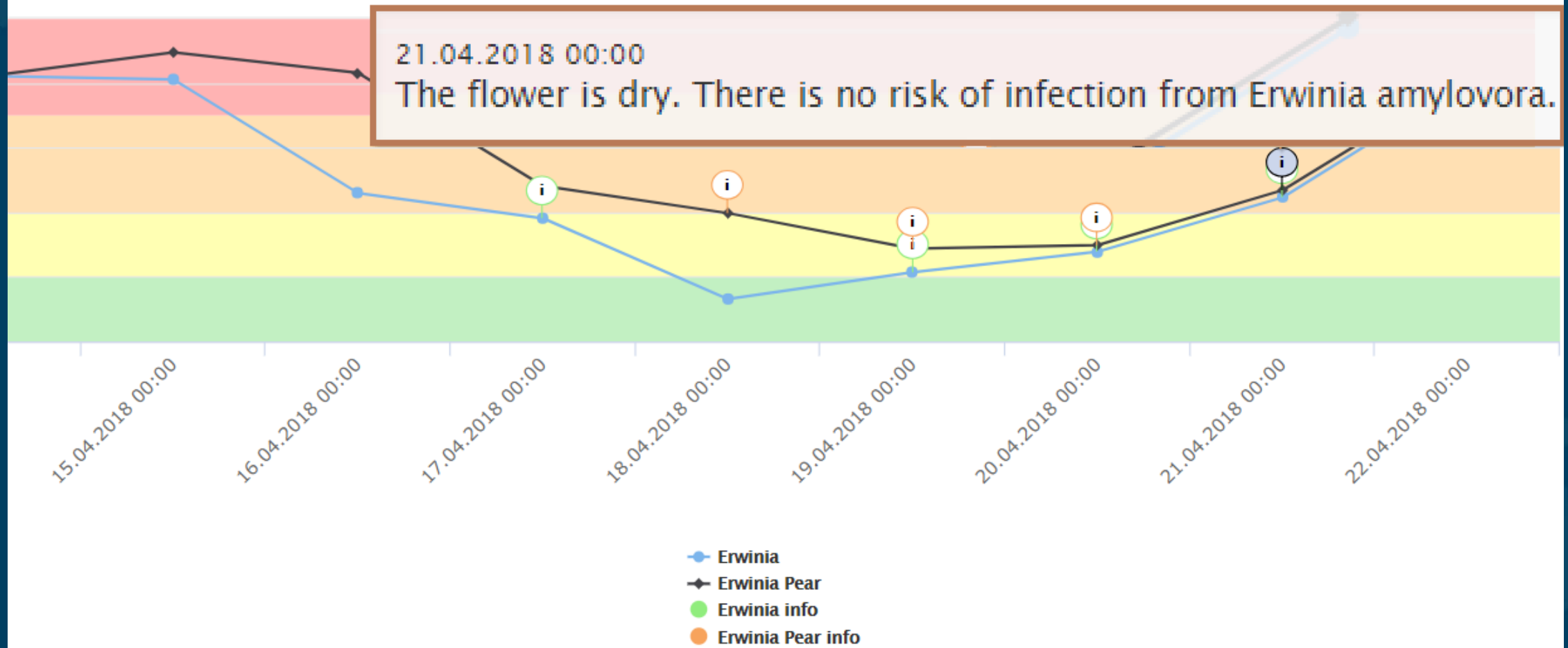
See more

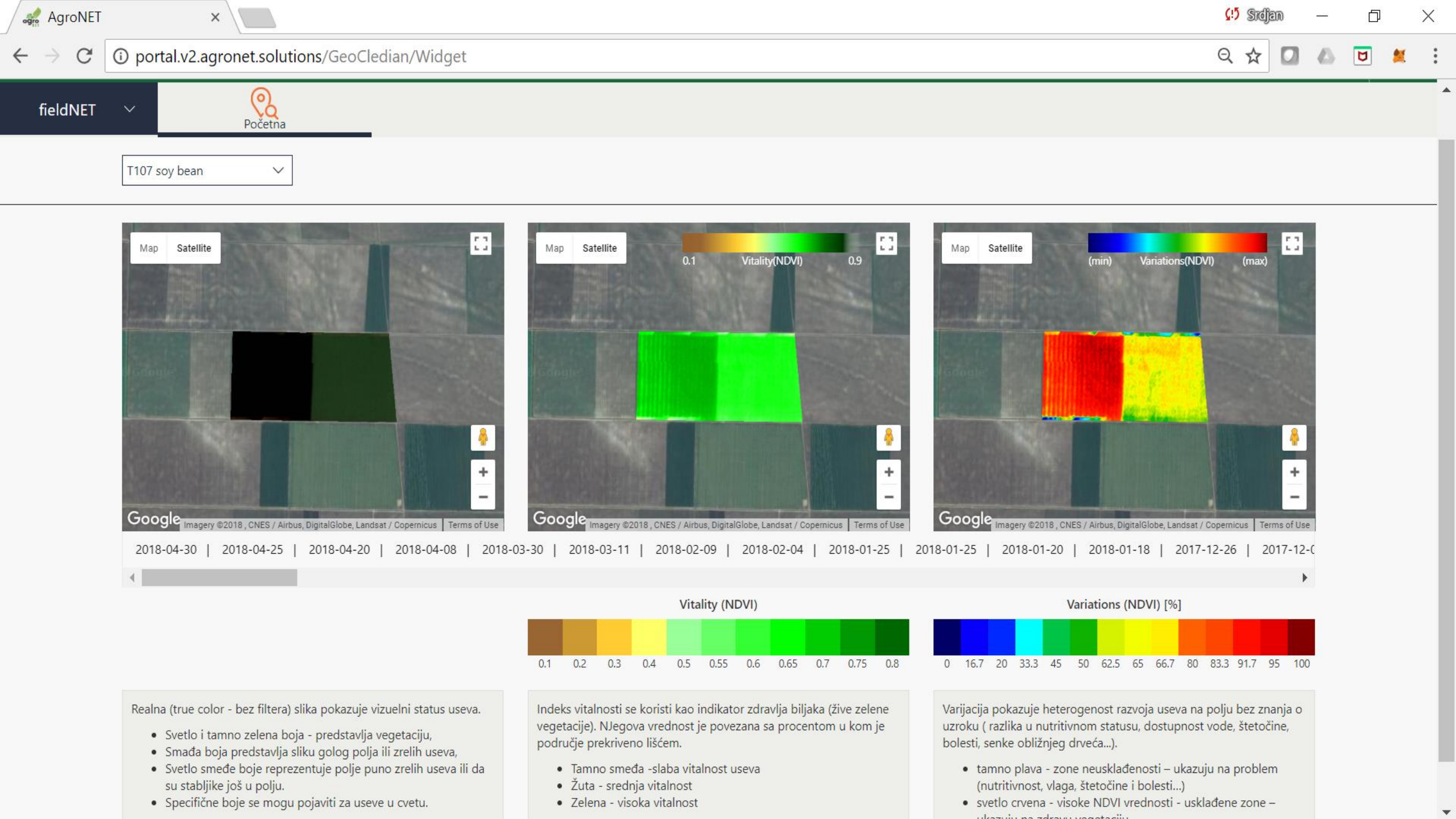
Device name	Notification
City Test	Irrigate with 5l of water per m2. Soil moisture: 15.9% . Threshold for the field: 16.9%. Expected p...
RHMZ Novi Sad	There is a possibility of infection.

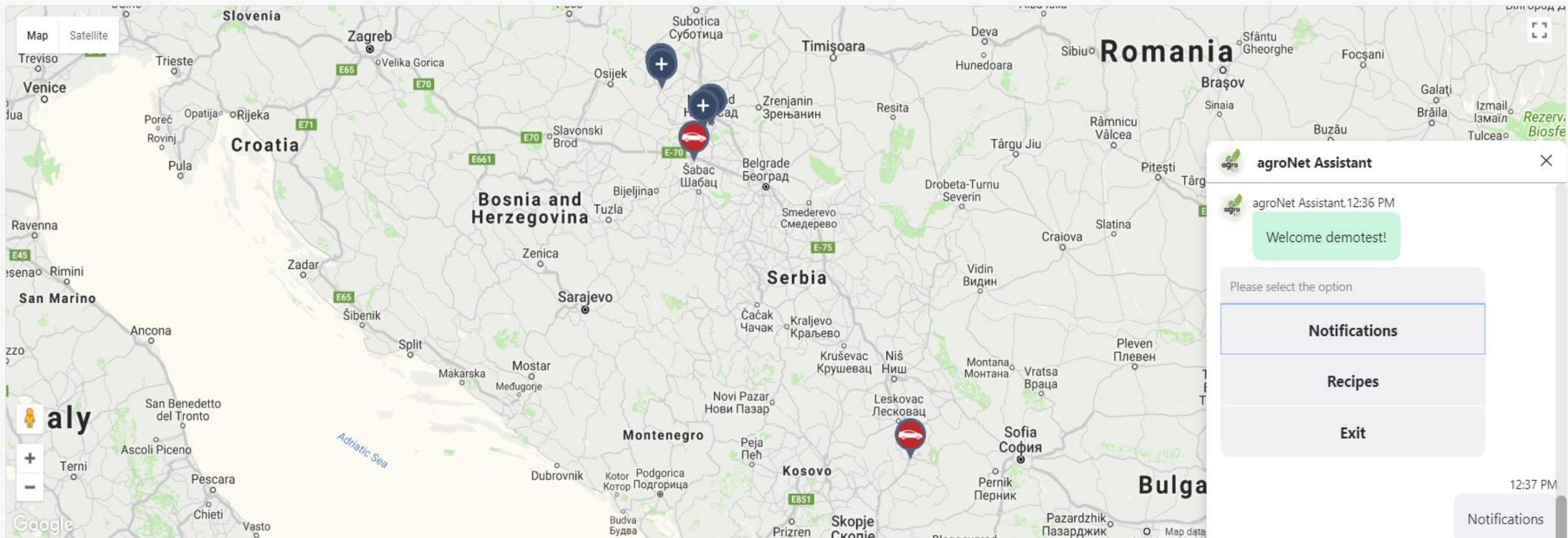
AgroNET assistant





## Erwinia, Erwinia pear







Naziv uređaja		Obaveštenje
	City Test	Nema potrebe za zalivanjem. Vlažnost zemljišta je 19% . Granična vrednost za parcelu je 16.9%.
	RHMZ Novi Sad	Postoji mogućnost da je došlo do infekcije.

agroNet Assistant

agroNet Assistant, 12:36 PM

Welcome demotest!

Please select the option

**Notifications**

**Recipes**

**Exit**

12:37 PM

Notifications

agroNet Assistant, 12:37 PM

5/8/2018 Irrigate with 5l of water per m2.  
Soil moisture: 0% . Threshold for the field:  
16.9%. Expected precipitation: 0% and daily  
maximum temperature in next 48h: 27.3°C.

Type to chat...



# Food mixture optimization in development



Nutrition	Dry matter	Ash	Raw proteins	Crude fats	Raw cellulose	ME (MJ/kg)	Lysine	Methionine	Meth + Cystine	Threonine	Tryptophan	Arginine	Isoleucine	Valine	Ca	Total p	Absorbable p	Na	Cl	K	Linoleic	Price
Kukuruz	87.00	1.20	8.50	3.80	2.20	14.00	0.23	0.17	0.36	0.30	0.06	0.39	0.30	0.40	0.02	0.27	0.08	0.02	0.05	0.33	1.78	128.60
Pšenica, meka	87.00	1.70	11.50	1.50	2.00	12.80	0.35	0.20	0.44	0.33	0.13	0.64	0.45	0.57	0.05	0.40	0.20	0.02	0.06	0.41	0.57	10.00
Ječam	88.00	2.20	10.10	1.80	4.50	11.00	0.38	0.17	0.40	0.35	0.13	0.48	0.36	0.52	0.07	0.34	0.19	0.02	0.16	0.48	0.75	0.00
Sirak	86.50	1.40	9.40	2.90	2.40	13.50	0.23	0.15	0.32	0.32	0.10	0.37	0.42	0.55	0.03	0.30	0.06	0.02	0.06	0.36	0.89	45.90
Pšenične mekinje	89.00	6.00	15.00	3.50	10.00	6.70	0.63	0.23	0.55	0.49	0.23	1.00	0.50	0.70	0.11	1.22	0.74	0.04	0.04	1.39	2.25	20.00
Stočno brašno	88.00	4.30	15.50	4.00	8.00	9.00	0.65	0.24	0.55	0.52	0.21	0.92	0.67	0.76	0.12	0.88	0.35	0.09	0.04	1.00	2.48	0.00
Sojin griz	89.00	5.20	36.00	18.00	7.00	14.70	2.25	0.50	1.05	1.44	0.50	2.62	1.75	1.75	0.25	0.60	0.10	0.02	0.03	1.85	9.50	0.00
Sojina sačma 44%SP	88.00	6.30	44.00	1.50	5.00	10.20	2.78	0.62	1.31	1.72	0.61	3.00	2.02	2.00	0.31	0.62	0.25	0.03	0.04	2.12	0.68	0.00
Sojina sačma 48%SP	88.00	6.30	48.00	1.50	4.00	10.00	2.89	0.66	1.35	1.83	0.66	3.54	2.29	2.29	0.34	0.65	0.15	0.03	0.09	2.10	0.55	0.00
Sojina pogača	94.00	5.00	39.40	9.10	4.90	13.00	2.90	0.60	1.19	1.69	0.53	2.80	2.17	2.01	0.30	0.60	0.10	0.03	0.06	1.70	0.93	0.00
Suncokretova sačma 33%SP	93.00	7.53	33.00	1.40	21.40	6.50	1.18	0.72	1.27	1.21	0.45	2.76	1.52	1.84	0.40	1.00	0.17	0.10	0.10	1.60	0.84	0.00

Showing 1 to 11 of 27 entries

Previous

1

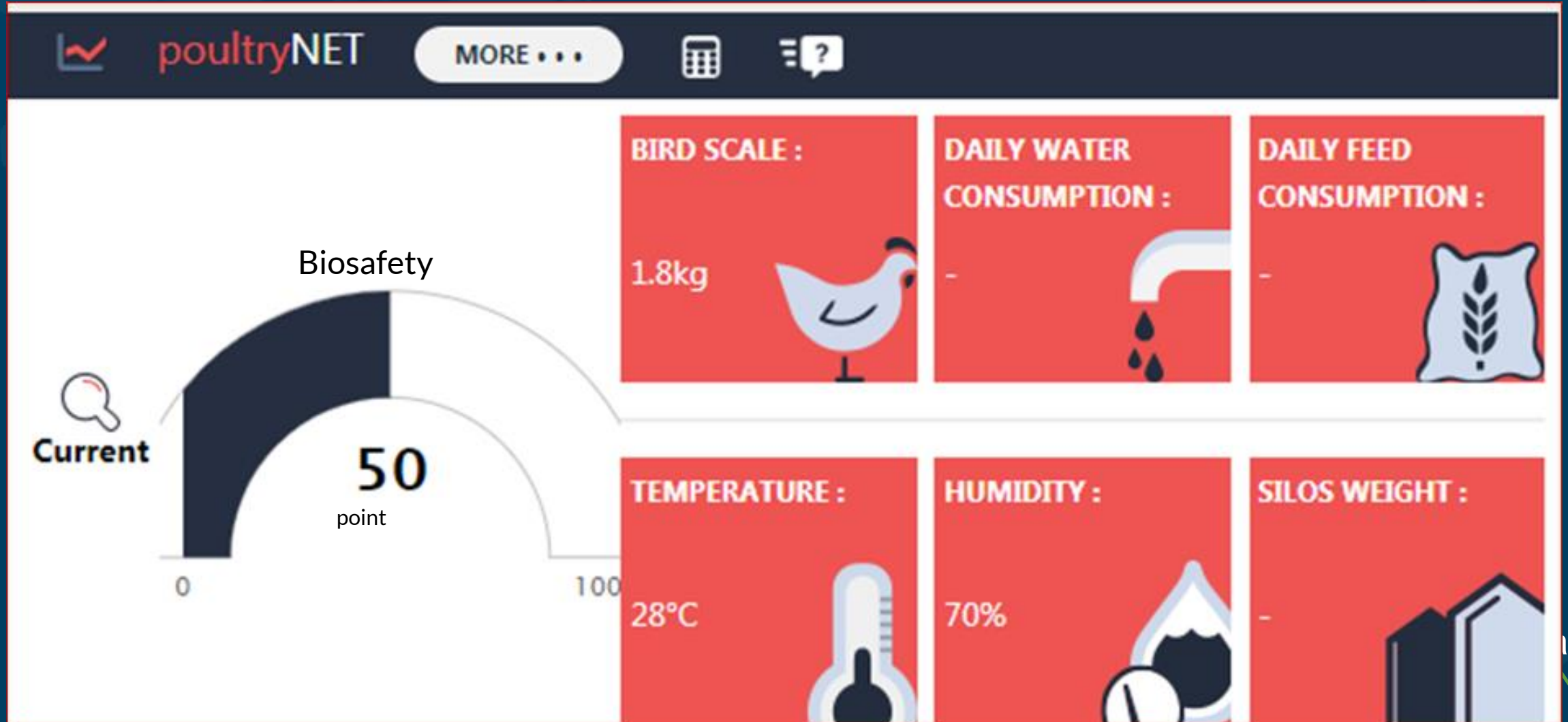
2

3

Next

Add

# Sensor measurements and data analysis in development



# What does glueNET do?

Optimizes application of adhesives in the process of affixing labels to bottles

Real time monitoring of environmental conditions to ensure optimal adhesion

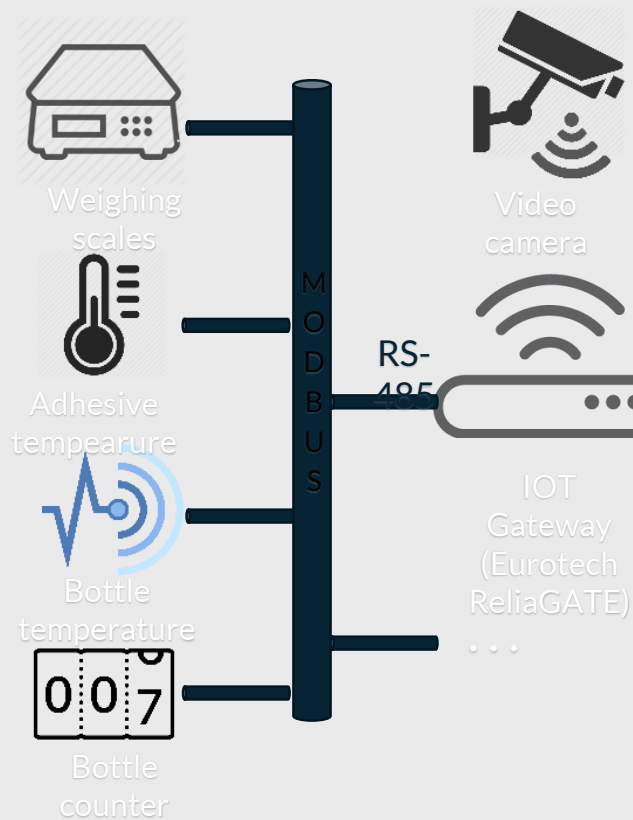
Real time monitoring of consumption of adhesives to ensure correct amount is used

Real time monitoring of affixing process to identify interruptions and track efficiency

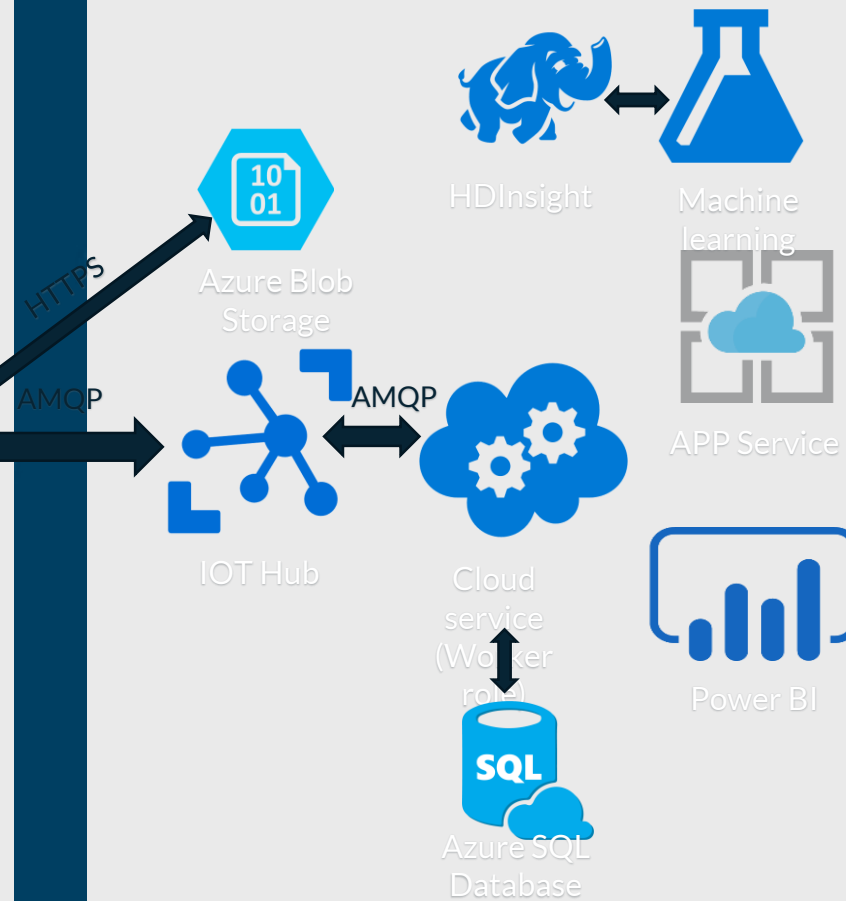
Generates reports to enable analysis and improvement of manufacturing processes and production of adhesives

# HW, SW details

## HW & Edge computing



## Cloud computing



## Client side



i

Brand image

—



i

Batch info

—

**Batch Start time:**  
Invalid Date

**Batch current time elapsed:**  
[Redacted]

**Brand:**  
Zaječarsko 0.33

**Adhesive:**  
[Redacted]  
Aquence GL 740

**Internal Batch ID:**  
Unknown

i

Batch Stats

—

**Line efficiency:**  
50.47 %

**Total labeled bottles:**  
74072 bottles

**Total adhesive consumed:**  
19.628 kg

**Active adhesive consumed:**

⚙

Aggregate 1

—



⚙

Aggregate 2

—



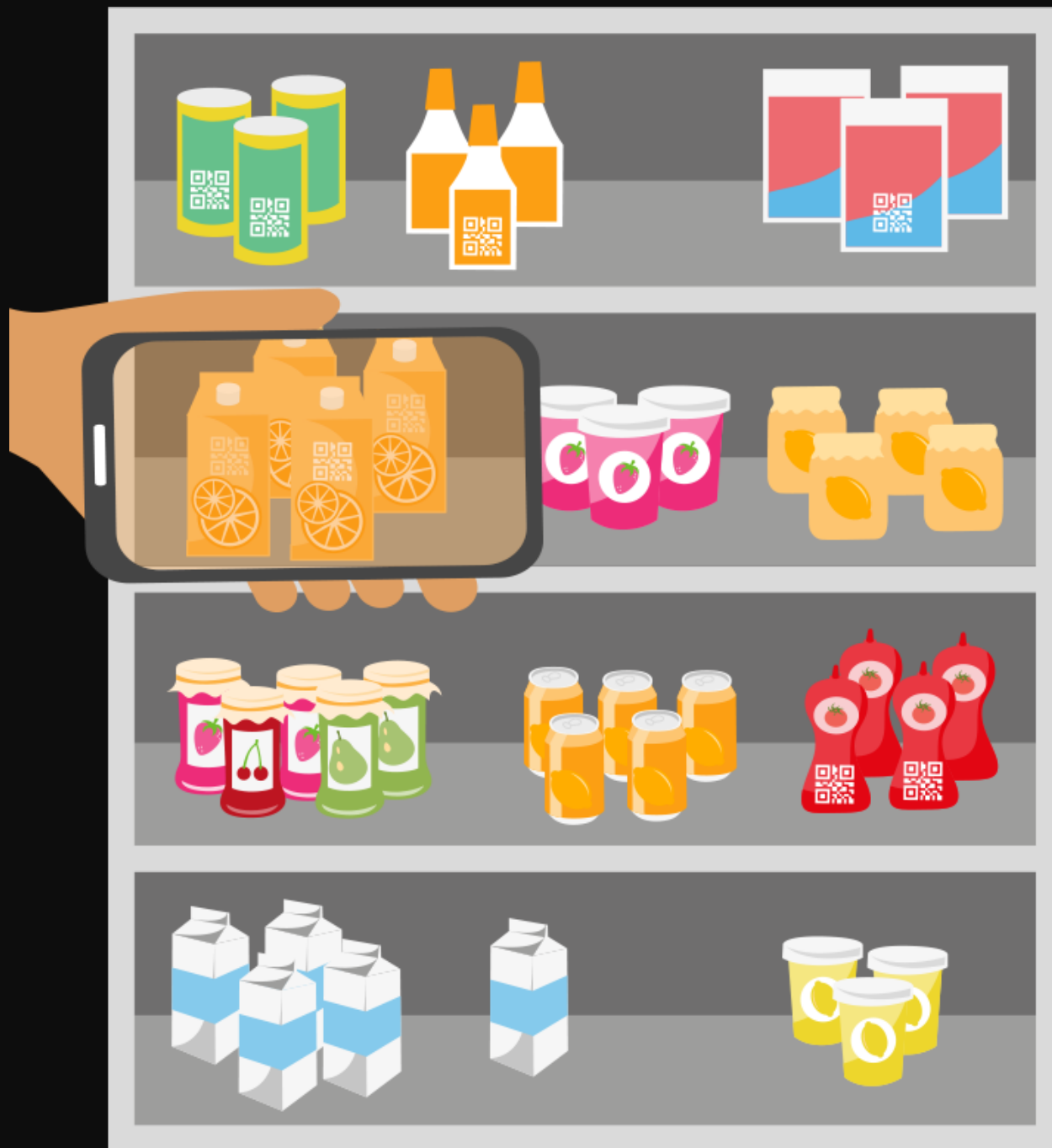






Enabling smart packaging for transparent  
supply chain with value-added services

**Dr Srdjan Krco (DunavNET)**



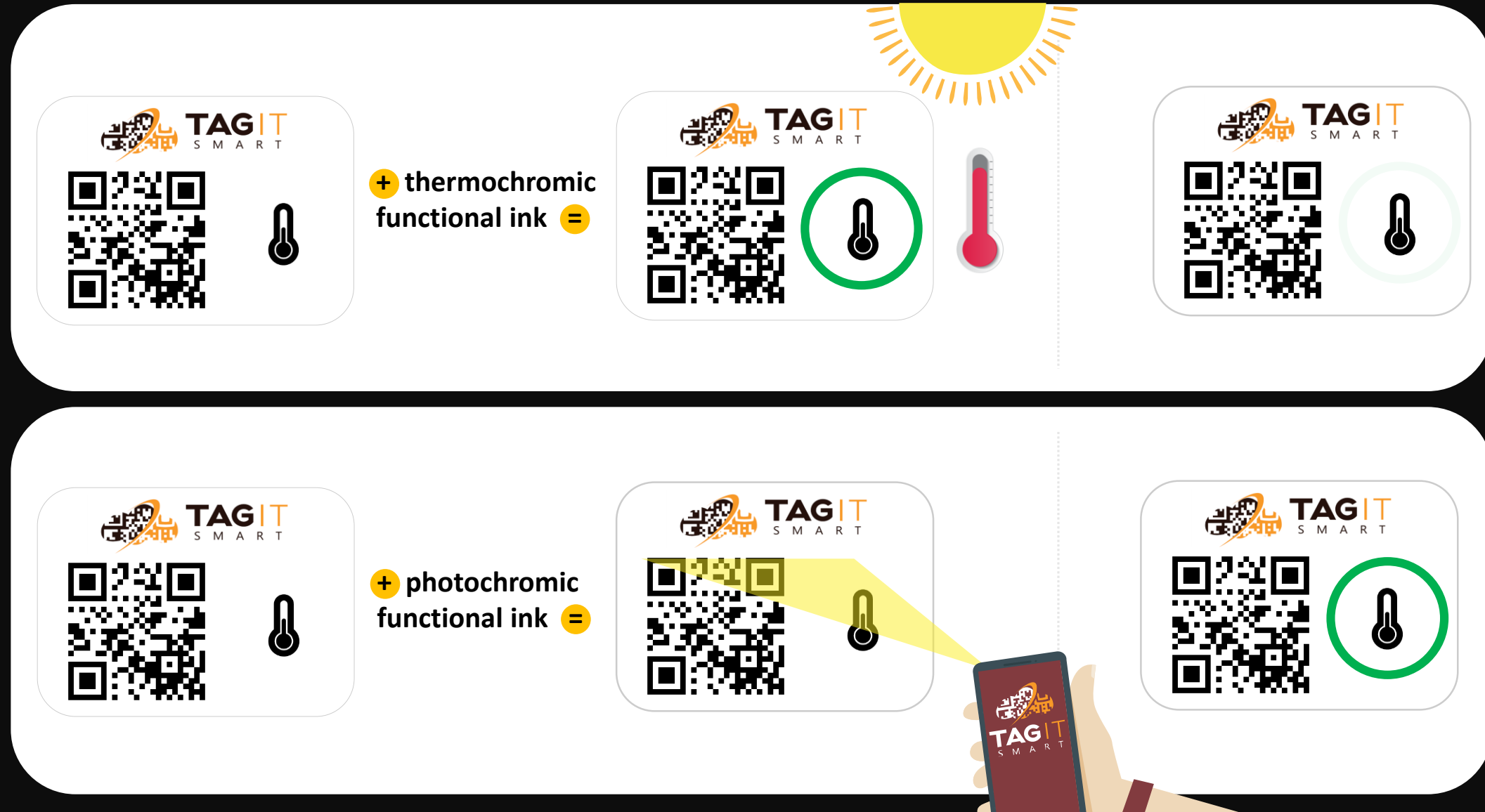
Do you know  
their story?

Let them  
speak...

Scorching  
hot...  
or cold and  
cozy...



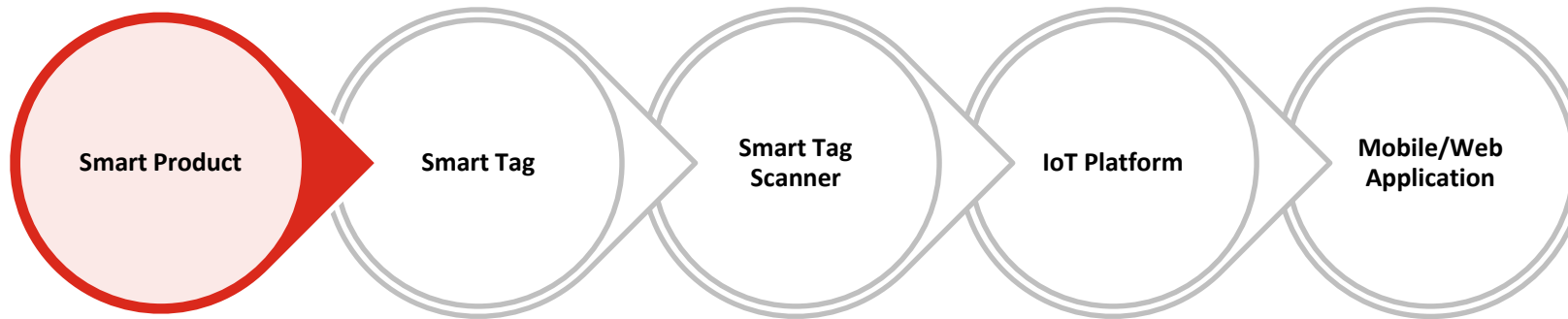
# Smart tags – it's how they speak!



**Smart printed tags + smartphones + cloud =  
IoT for mass-market products**

*A Smart Tags driven service platform for enabling ecosystems of connected objects*

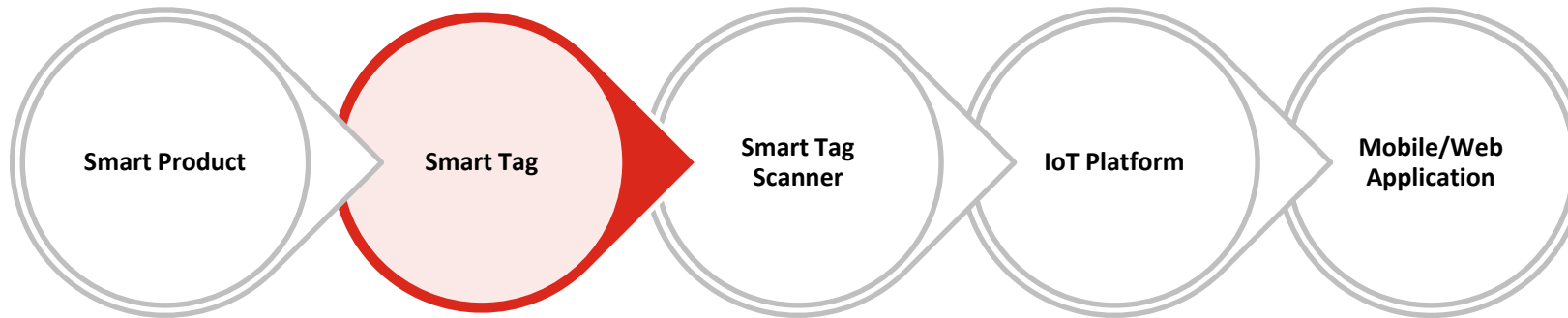
## ■ TagItSmart Application Anatomy



- Smart Products  
Ice cream, Meat, Beer,...
- Smart Devices  
Light,Boiler,...

*A Smart Tags driven service platform for enabling ecosystems of connected objects*

## ■ TagItSmart Application Anatomy

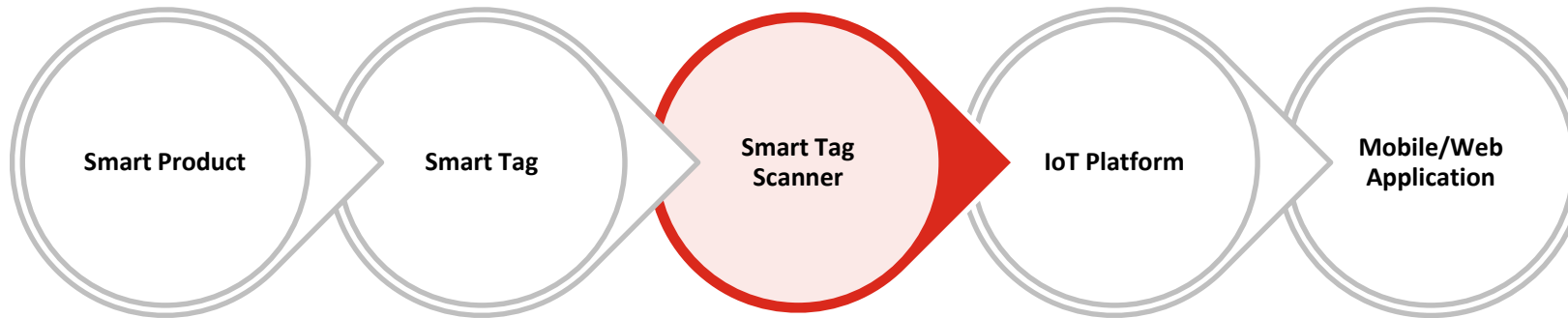


- Identification  
QR Code/Image/NFC/...
- Sensoring  
Thermochromic/UV Light/...



*A Smart Tags driven service platform for enabling ecosystems of connected objects*

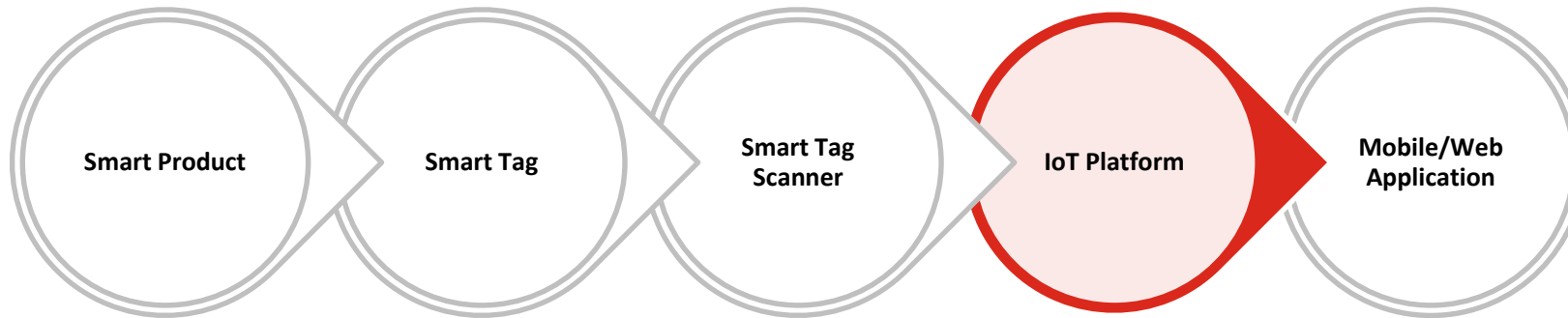
## ■ TagItSmart Application Anatomy



- Stand Alone Scanner  
Supermarket scanner,...
- Integrated Scanner  
Mobile Application Scanner

*A Smart Tags driven service platform for enabling ecosystems of connected objects*

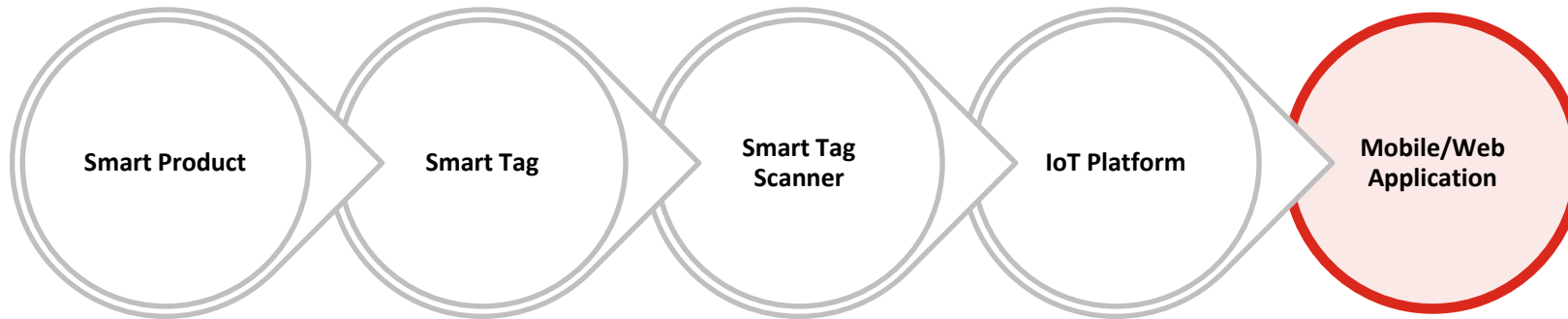
## ■ TagItSmart Application Anatomy



- Data Access
- Data Processing/Analytics
- Security Management
- Service Management
  - Execution, Integrations,...

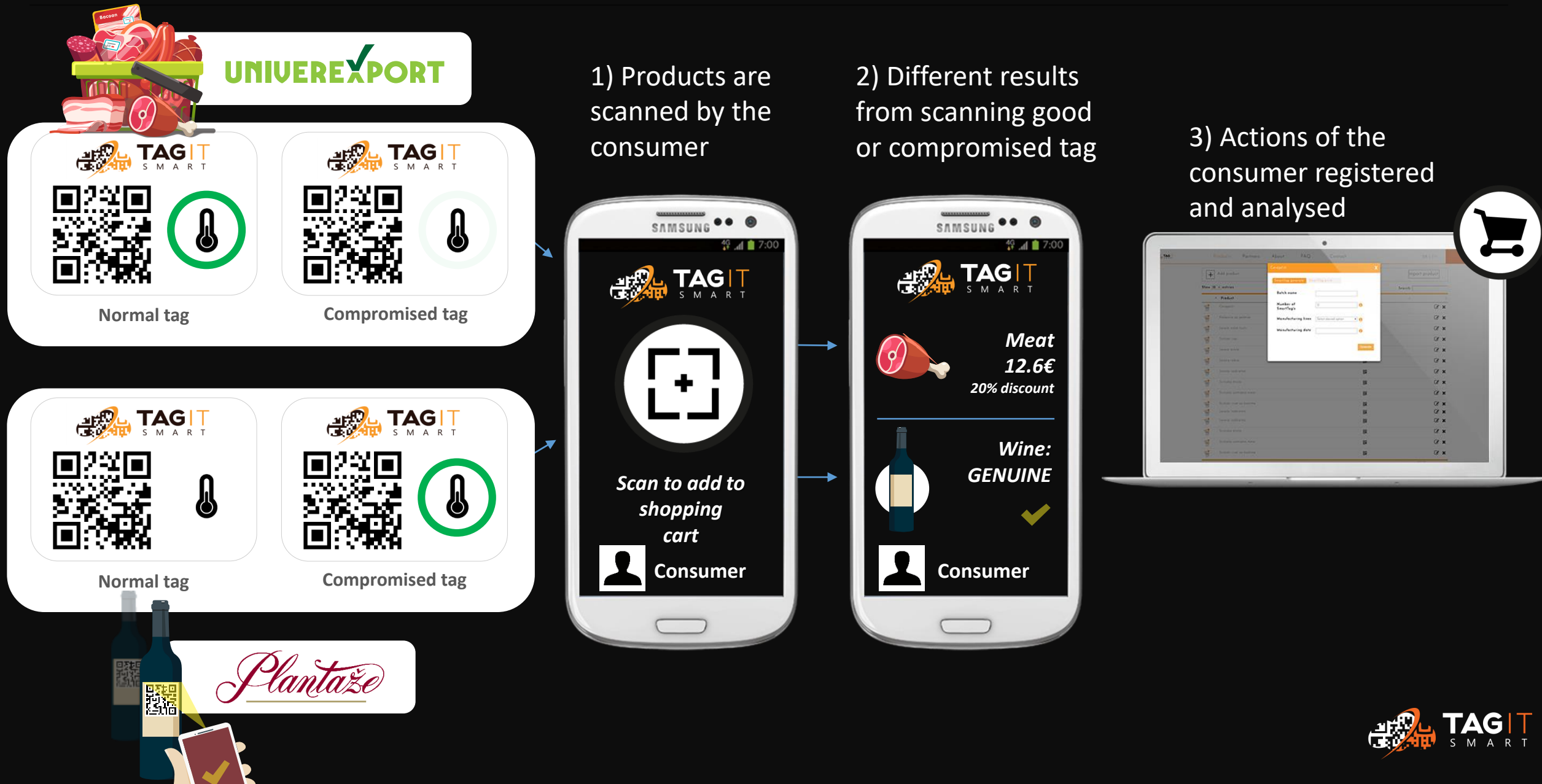
*A Smart Tags driven service platform for enabling ecosystems of connected objects*

## ■ TagItSmart Application Anatomy



- User Experience and Interaction with the Smart Product

# In-store consumer interaction with products



# Pilot deployments

- **Univerexport (retail chain, farm):** individual item level cold supply chain monitoring with dynamic pricing
- **Unilever (FMCG):** individual item level cold supply chain monitoring and consumer experience improvement
- **Public municipality in Spain:** helping citizens to recycle better and more
- **Carrefour (Spain):** improving recycling habits
- **Bock's brewery (Finland):** supply chain traceability
- **Leroy Merlin (retail chain):** improving efficiency and quality of aftersales services
- **Plantaze (wine producer, >2000ha of vineyards):** preventing counterfeiting and providing added value services to consumers
- **Association of honey producers of Montenegro (over 2000 members):** preventing counterfeiting
- **Hospital in Greece:** improving management of tools and drugs
- **Factory in Serbia:** monitoring condition of machine parts

To remember...



**Steaks, beer, wine, ice cream,...are going digital.  
TagItSmart is building the road.**





[www.dunavnet.eu](http://www.dunavnet.eu)

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[srdjan.krco@dunavnet.eu](mailto:srdjan.krco@dunavnet.eu)