From smart agrifood to smart urban gardens

SMART GREEN

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System architecture for smart green management:

SERVICES

Displaying information on a map, sending specific alerts, remote management of plants, smart actuators.

BIG DATA ANALYTICS

Support on the management and use of connected services.

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02

01



DATA TRANSMISSION

LoRaWAN technology enables remote management of data recorded by sensors.

04



SENSORS

Detectors and measurers, with reduced energy consumption.

SMART AGRIFOOD

Numerous studies have highlighted the importance of applying **new technologies** in agriculture, particularly in the wine sector and in corn plantations. Research and innovation have made **precision agriculture** possible, with targeted activities on selected land or specific plants.

The solution

In-field IoT

Sensors distributed across cultivated areas or installed in indoor and outdoors facilities, to record and monitor remotely key variables for the customer.

Agriculture

- soil
- air quality

Husbandry

- livestock tracking
- livestock conditions
- stables and machinery

Mounted IoT

Drones *

Aero-photogrammetric analysis. Predictive and/or real time response:

- optical/laser analysis
- calibrated and targeted treatments where and when necessary

Smart tractors

- sensors on vehicles, for monitoring of day to day operations
- implementation of ISOBUS technology

* DRONES - APR (Remote Piloted Aircraft)

In the context of precision agriculture. Currently the APRs are used to collect data through images and, in a second stage, to perform targeted agronomic activites (for example: distribution of Tricogramma Maidis eggs capsules on corn fields, a parasitic imogen used against pyridis).

Analysis of images collected, coupled with the data extracted from the sensors on the ground, provides all the elements for an effective monitoring of the land and cultivated fields.





-30%

WATER CONSUMPTION

-40% PHYTOSANITARY TREATMENTS

REDUCTION IN LABOUF COSTS, FUEL FOR VEHICLES AND PHYTOSANITARIES USED IN THE SOIL



SMART COW

IoT technology is increasingly being used in the animal husbandry sector. Our solution allows farmers to monitor remotely and in real time climatic condition in stables, to improve livestock welfare. Geolocation is also useful to locate livestock individually.

The solution

IoT monitoring:

- sensors installed in farm facilities to detect ambient data such as temperature, humidity, noise
- sensors placed on livestock to track and geolocalise movements and monitor health conditions.

Data Analysis:

additionaly to the sensor network, the platform will collect, save, manage data through a dashboard. A front-end (web and mobile) will allow user to visualise data, obtain additional information, activate pre-established action options based on collected data.

Advantages

- Livestock welfare: the constant monitoring of environmental data on farm facilities improves livestock welfare through effective response.
- Localise livestock: applying
 a tracking sensor to monitor livestock, avoiding loss and theft.

SMART URBAN GARDEN

Green is not just agriculture. A solution for **urban parks and vegetable gardens** has been developed.

Parks are important spaces to safeguard: they are meeting points for the community, an attraction for tourists, locations for events.

The solution

The **Smart Urban Garden** infrastructure foresees the development of a sensor system with full coverage of the park areas, nature areas and facilities, and the development of a system for sharing information with users.



Activities to enhance parks and gardens:

- monitoring of air quality to collect impact data on changes in urban vegetation and urban air quality;
- monitoring visitors streams and park access management;
- facilitate collaborative initiatives among interest parties involved in the promotion of the park;
- analysis of biodiversity mix, by monitoring vegetation and wild animals transiting through the park, coupled with on-site atmospheric conditions;
- crop monitoring;
- processing data.

BEACON SENSITIVE WALK

BEACON (small radio transmitters Bluetooth), located in specific points along pathways, transmits directly to the device of visitors (smartphone or tablet) information on the biodiversity of the park.

SMART GREEN

SMART GREEN HOUSE

A greenhouse is an artificial, purpose-built structure to replicate optimal conditions in various natural habitats.

There are different designs of Greenhouses: permanent or seasonal, heated, not heated or chilled, with natural or hydroponic crops, intended for ordinary or farmed crops or for the desiccation of products. In all cases, precisely because the climatic conditions are artificially recreated, monitoring of environmental conditions is critical.

MADE **TO MEASURE**

Services can be customised to the needs of the individual system. Sensors are battery powered and therefore easily installed in any position.

Current available sensors:

- hygrometer
- soil moisture sensor
- string meter
- luximeter
- dendrometer
- leaf wetness sensor
- UV sensor
- solar radiation



Variables to monitor are:

- temperature
- humidity
- brightness
- dew point
- heating system functioning
- setting of minimum and maximum temperature points
- water consumption
- soil moisture (where applicable)

SMART RISK

Monitoring potential hazards

Landslides and floods occur with a higher frequency. It is therefore essential to provide specific monitoring systems, both for prevention and effective response, limiting damage to infrastructure and people.

Monitoring tools for landslides:

- strain gauges: measures the relative displacement between two points on both sides of a fracture;
- distometers: measures changes in distance between two fixed points, e.g. the walls where there is a large fracture; the main use is on rock formations.
- **joint measurers:** measuring small fractures.
- Inclinometers: to monitor ground micro-displacements with precise subsoil measurements.
- piezometers: measure the aquifer level.

Surface water bodies levels:

monitoring of watercourses and lakes to prevent floods, plan for the use of detention basins and redirect floods to avoid damages to inhabited areas.



Services for precision agriculture, crops and animal husbandry, solutions for greenhouses and urban gardens, smart monitoring for hazards prevention.

Smart Green is a complete system to effectively manage plant health, soil irrigation needs, climatic conditions and animal welfare, for indoor and outdoor applications.



info@a2asmartcity.io

a2asmartcity.io lineacom.it

