

SENVIRO: A PLATFORM FOR MONITORING THE ENVIRONMENT

DESCRIPTION OF THE TECHNOLOGY

SEnviro is a platform for monitoring the environment, capable of measuring any kind of variable that can be quantified by means of sensors, including meteorological variables such as temperature, humidity or rainfall, as well as air quality parameters like gases, particulate matter or noise, among others. *SEnviro* differs from other sensor systems due to its modular design, which makes it easy to add new sensors to monitor new variables of interest, its own independent power supply and the low cost of its components. The platform that has been developed is applicable to fields such as smart agriculture, industry 4.0 or the management of smart cities.

Another of the features that defines the *SEnviro* platform is the interoperability that it offers, since it provides interfaces with standard connections which increase its integration and facilitate access to the data it generates.

SEnviro follows the Internet of Things, Big Data and Cloud Computing paradigms. It consists of two sub-products: a generic sensor node called the *SEnviro node*, and a web platform called *SEnviro connect* (under development), which is capable of managing the different nodes and offering added value to the data from the nodes.

The sensor node, depending on each particular use, is capable of autonomously measuring any kind of variable or carrying out any kind of action upon a physical actuator and offering a series of different options in terms of connectivity.

SEnviro allows data from the sensors to be integrated and viewed by means of a dashboard, which makes it possible to address the challenge of visualising huge amounts of data in a smaller format and in real time. The system applies big data techniques to analyse the information received from each of the sensors and to offer an image that is both comprehensible and helpful to the user.

The technology offered by the dashboard can be considered reactive, since it is capable of reacting to the input data flows from the sensors by following certain patterns. Thus it can launch alerts or events when certain conditions are met that deserve the user's attention and require him or her to perform some sort of action. These actions may be manual or automatic. While manual operations will be applied by the users after receiving the recommendations obtained from the different analyses, in the automatic operations the sensors themselves will be able to act by themselves. To this end, each *SEnviro* node will adapt to the different states in which they are installed, that is, they will vary their behaviour to match a particular state, in addition to being capable of performing actions automatically. Examples of such behaviour include activating the irrigation system on a farm, or limiting the circulation of vehicles in cities with high levels of pollution.

By offering both the sensor nodes and a data analysis platform, *SEnviro* represents the first integral solution in this field.

SECTORS FOR COMMERCIAL APPLICATION

The technology is useful for the following sectors:

- Precision farming and crop monitoring: it allows improvements to be made in production performance and quality.
- Environmental monitoring for smart cities.
- Monitoring industrial environments.

TECHNICAL ADVANTAGES AND COMMERCIAL BENEFITS

SEnviro is cheaper than any other comparable solution. Moreover, it has more sensors and is open to the addition of other capabilities depending on the use it is to be put to. Each *SEnviro* node is autonomous at both the energetic and connectivity levels; that is to say, unlike other solutions it does not need other nodes or collectors to be able to send the observations. Another distinguishing feature of the *SEnviro* platform is the

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use of open-source hardware, which facilitates its re-use and compatibility. The main advantages of the tool are:

- It is a modular application and can thus be adapted to any field and/or firm by adding new capabilities.
- It is based on open standards.
- It is an autonomous system in terms of energy and connectivity.
- It uses GIS standards to increase interoperability.
- It is inexpensive.
- It uses open-source software and hardware, which increases its compatibility.

STAGE OF DEVELOPMENT OF THE TECHNOLOGY

Prototype available.

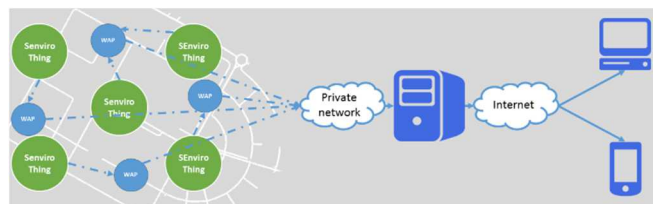
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