YNNOVA
LEADING AGRITECH

USE CASE

MECHANICAL IMPLEMENTS DIGITIZATION

Mechanical farm implements are often not equipped with electronic controllers.These implements (e.g. ploughs) are subject to the **loss of critical information** that could be useful to both OEMs and farmers. **OEMs and farmers** dealing with these implements are therefore excluded from the **digitisation paradigm** and from the opportunity to transform **production processes and business strategies.** Ynnova was asked by both OEMs and farmers to deliver a device that could provide specific information from their mechanical implements, even if they were not designed to generate data themselves.

An all-round system

Ynnova's system is made up of hardware, the **IOTBOX2**, which **supports 4G and Wi-Fi worldwide,** and a **cloud platform for data analytics**. This use case analyses a critical situation where Ynnova's system needs to be implemented, as there is no control unit that can make mechanical farm implements communicate with the cloud platform, and a fundamental requirement of the **digitisation paradigm** is to have bi-directional communication between the machine and Ynnova's cloud portals (YConnect and YService). Several parameters of the implement can be managed by the IOTBOX2 itself, for example, thanks to the i**ntegrated GPS antenna**, it can track the position and speed of the implement. If a more precise geo-localisation of the implement is required, it is possible to connect Ynnova's **SMART high precision GPS antenna, Scorpion**, to the IOTBOX2. IOTBOX2 also records machine working hours, often used by OEMs to **plan scheduled machine maintenance** based on parameter status. IOTBOX2 collects data from the field and sends it to the YC/YS portal at regular intervals. In order to manage additional working parameters, it is possible to install specific sensors on the machine, depending on the different mechanical farm implement and specific customer needs. Few examples follow:

- Working depth sensors
- Pressure sensors
- RPM sensors
- Working width sensors (i.e. for seeding machines, plough and others)
- Mechanical cycle counters (for machines with repetitive mechanical cycles)

The IOTBOX2 and YC/YS portal ecosystem allows bi-directional communication of the following data

- Sensor configuration data
- Machine parameters
- X-Offset and Y-Offset of GPS positioning
- Total working hours
- Calculated speed
- GPS position with date and time
- Machine working/non-working status
- Values acqured by additional sensors

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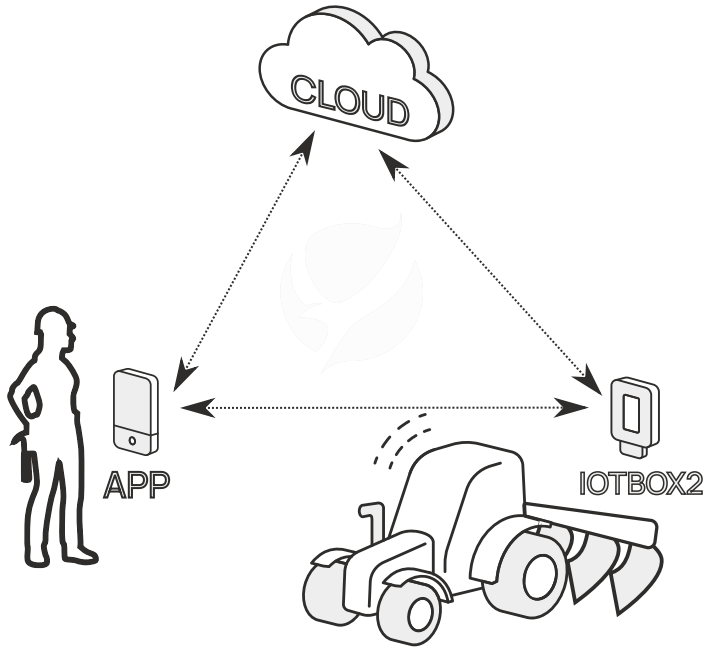
An App acting as a human interface

In order to provide the missing bi-directional communication between the mechanical device and YConnect/YService, Ynnova developed an **APP** to be made available to all users. The APP **acts as an electronic control unit, as a human interface**: the **enduser** will receive commands and information to act on the implement via the APP and from the cloud portal. He will also be able to **send commands to the cloud portal via the APP**.
YConnect app functionalities can be summerised as follows:

- End-user account generation
- Job settings
- IOTBOX2 provisioning
- Job order information
- Operator name
- Free text field
- Real-time data transmission from and to the cloud portal
- Sending and receiving “job start” and “job end” commands from and to the cloud portal

Outcome

OEMs and farmers can use Ynnova’s system to **turn** their **machines** and even mechanical farm implements **into smart machines**. OEMs will **improve** their **after-sales service in line with the servitisation business model** and farmers will be able to monitor all desired parameters.
In addition, Ynnova’s solution does not require the machine to be equipped with the ISOBUS communication protocol.



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