

open**SAP**

# TOUCH IOT WITH SAP LEONARDO PROTOTYPE CHALLENGE

## SMART AGRICULTURE

The Future of Farming through the IoT Perspective



Wireless and autonomous M2M sensors are installed in the field between the crops.

Unmanned Aerial Vehicles, from the sky, take multispectral images looking for irregularities.

Utility equipment moves around the farm with the tasks programmed by the data collected from the sensors.

The sensors in the soil measures the moisture and the nutrient availability and periodically transmits all captured information to the SAP Cloud Platform, where the data is processed and presented as usable information.

A farming based on smart data processing significantly reduces costs; makes grow up crops yield, and the most important reason: are eco-friendly due to responsible use of natural resources such as drinking water.

It's not science fiction; the internet of things is fast converting Agriculture into Smart Agriculture.

# Story

## Summary

The Farm manager needs a solution to monitor, control and carried out an efficient farming cycle, increasing the crop yield and lowering costs being compliant with the environment.

## Storyline

The Farm manager is interested to know any factors that could be impact in the crop yield, the water quality, the soil-moisture, the fertilizers utilized and soil nutrient index, among other things.

The farmer needs to be notified as soon as possible, if there is any problem, to active the plan to solution as soon as possible. After that, he must to do a root cause analysis (RCA) to learn and prevent in the future the same situation.

In the near future will not enough water for agricultural purposes. Agriculture consumes 70 percent of the world's fresh water supply; hence, water management will go hand in hand with assuring food security, so is necessity start immediately a plan of precision agriculture.

In conclusion, it's the opportunity to make a difference using science and technological innovation to address critical issues that will have profound effect on the lives of billions of people.

Advances in science have increased crop yields while at the same time modern irrigation strategies help farmers make more efficient use of water. However yields must be increased further, because The Food and Agriculture Organization of the United Nations (fao.org) have predicted, by 2050, that the world's population will reach 9.6 billion people.

In order to keep up with rising populations, global food production must increase by 70 percent in order to be able to feed the world by 2050.

# Persona



## John Dyers

Farm manager

*"...I would like to monitor to understand and take the best decisions over all essential variables of goods available existing relative to farming. I have the responsibility to planning the development of an eco-friendly Smart Agriculture."*

### About Dyers

- 67, married.
- 43 years' experience as Farm Manager, being the person who makes the decisions in the farms.
- I have to keep the balance between improving the resources efficiency and good services.
- I believe that the technology can help to improve the world.
- I work with the Technicians, Admins, Contractors, Cooperatives, Operators, Farmers, Suppliers and final Customers.

### Responsibilities

- Plan resource allocation and utilization of resources.
- Monitor capacity of resources being used.
- Analyze cost to value maximization of resource utilization.
- Devise a checklist for aligning the annual work plan objectives
- Ensure regulatory compliance and the environmental policy.

### Main Goals

- Increase crop yield
- Assess availability of resources and upkeep appropriately.
- Ensure responsibilities by staff and suppliers if they are completed satisfactorily.

### Needs

- We need apply quickly agriculture of precision.
- We need to monitor crops to know any deviations just in time.
- I need to ability to record alerts or notifications instantly since I am away from my desk most of the time.
- We need to be able to know if there are abnormal events related to the crops, the sensors on the soil, the utility vehicles or the UAVs (Unmanned Aerial Vehicle) all in real time.

### Pain Points

- The use of resources is not smart.
- Low crop yield
- No metrics about utilization rate of the water, fertilizers and soil nutrient index.
- Status of the fertilizers utilization is unknown or outdated.

### Competencies

Casual User					Power User
Proactive		○			Reactive
Work in Team			○		Lone Fighter
Global Focus		○			Local Focus
Innovative			○		Conservative

# Point of View (PoV)

Dyers, the Farm manager...

... **NEEDS TO** have a quick overview of the data from sensors installed in the farms **SO THAT** he can know the behavior and take more efficient decisions just in time.

... **NEEDS TO A WAY TO** detect if there are abnormal events **SO THAT** he can execute the appropriate procedure by informing in a timely manner to the stakeholders and partners who have responsibility of it.

... **NEEDS TO** know the variables utilization of water, and fertilizer, the soil nutrients index, as well as, the weather, **SO THAT** he can create a planification based on the metrics captured automatically.

# User eXperience Journey

Duration of the Journey: 120 min

ACTIONS	> Call 'Good Morning' about notifications with all team.	> Pick up the alert list.	> Alert that one of the crops grows abnormally because not enough water is received.	> Focus on the current alerts	> A weather alert in process!	> The problem with the water was solved.  > A weather alert finished, it wasn't for this area.
MINDSET	How I can automate the notifications?	How to improve the communication to a real time?	Now I need to take a look at all the crops manually again. Why we do not have "eyes on the sky"?	I do not have time to do an intelligent planning.  We will need to re-plan all tasks.	I need to check a new weather report  Rework!	Fortunately, the problem was only an operational problem: the water valve was closed!  We need to know the state in real-time of all components.
FEELING	😊					
TOUCH POINTS	> NOTEBOOK (pencil) > PHONE > WORKSTATIONS > CHECKLIST	> SENSORS > REPORTS (paper and digital) > LAPTOP (emails)	> DASHBOARD > SOIL MOISTURE SENSORS > DRONE and UAV (Unmanned Aerial Vehicle)	> SPREADSHEET, email > CALL with the stockholders	> INTERNET, computer. > A WEATHER STATION ON THE FARM	> WIRELESS and AUTONOMOUS M2M SENSORS  > GLOBAL DATACENTER

# Mockup & Prototype



Link to Build.me Prototype: [https://standard.build.me/prototype-editors/api/public/v1/snapshots/c8f4ca28ce26eb000e1c784a/artifacts/latest/index.html#/launch\\_page](https://standard.build.me/prototype-editors/api/public/v1/snapshots/c8f4ca28ce26eb000e1c784a/artifacts/latest/index.html#/launch_page)

## Wireframes

High-Fidelity

### Soil Sensor

Stevens  
Hydra Probe



### Unmanned Aerial Vehicle

LANCASTER 5 +  
Tetracam Multispectral

