

Vitimobility - Increasing the ability to change in agriculture in the spirit of mobilization

CONSORTIUM

Seacon Europe (leading partner) (Hungary)

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BUSINESS PROBLEM AND SOLUTION

Through our project, we try to offer an innovative solution in the field of precision agriculture in order to obtain and have a good organic product, in our case a better quality of grapes and wine.

For this we propose to realize the drone system as a complex package for small farmers who cannot ensure a better monitoring of their vineyard. This monitoring is in front of the computer or mobile phone and consists of analysis of the leaf health, recommendation of good ecological treatments in case of disease detection with the help of AI, as well as weather conditions.

The drone system consists of:

- *IoT sensors that are integrated into the drone, sensors that collect data such as leaf moisture, air humidity and temperature, solar radiation*
- *Camera for image processing*
- *Visualization and analysis of data using AI*
- *Farmers' app platform*
- *Mapping of vine health problem areas, layer maps*

Because a drone has the ability to fly much closer to the canopy, it provides a more detailed look at individual vineyard areas. Where satellites might provide 2-meter resolution, drones can provide 2.5-centimeter resolution. Grape growers can use drones to assess a vineyard more frequently. Observing a vineyard aerially 5 or 10 times a season enables vintners to assess the progression of leaf roll, for instance, or see how irrigation choices are affecting vigor in a particular block.

Drones are also better at helping vintners troubleshoot specific issues, such as where to fertilize, apply pesticides, prune, or perform differential harvesting, which translates into cost savings on pesticides, fertilizer, and labor costs.

SITUATION-DEPENDENT DATA COLLECTION - CHANGEABLE MEASUREMENTS

One of the challenges here is the development of situation-dependent measurement techniques, which includes location-specific and condition-specific measurements and analyses. The usual methods require a fixed installation, which includes the periodic connection of the sensors to a location, the constancy of the parameters to be measured. In addition to this or as an alternative to this, we want to build on drone measurements, in which case there is no need for the fixed installation of the sensors, the data can be measured during each flight, and with this the necessary measurement frequency can be determined in a variable way. Deviating from the constant quarter-hourly or hourly measurement

frequency, the flying of the drones can be adapted to professional considerations, as a result of which we avoid the formation of unnecessary data, but we can still provide the necessary information to make effective decisions.

GREENER PRODUCTION

The main objective in the project is to save time and money for the farmers. One way we can do this is by providing real remote information about the lands (plants, air, soil, weather) with an appropriate frequency.

Just as through this project we are trying to offer an innovative solution in precision farming to produce a good organic product, we are also trying to offer a green alternative through the use of drones. In this sense drones are battery-operated, they are a greener alternative for renewable energy and in this way greenhouse gas emissions are reduced. This will help to reduce the usage of the vehicles for the personal field inspection, along with the carbon dioxide emissions.

This kind of green transition is the result of the collaboration of the agricultural/viticultural industry and the ICT technology/communication. We believe that the real business sector and technology together are able to provide effective results in the industries.

INCREASED CUSTOMER SATISFACTION THROUGH QUALITY VINE PRODUCTS

The project approach will identify innovative ways to derive maximum value from the possible integration of drone, IoT, big data technologies. The artificial intelligence tools will handle the volume of data with different structures. The use of wireless sensor networks with IoT based applications will be used to gather real time data to feed as input to the platform. It is understood that the IoT applications will empower the majority of the crop-related industries to extend their value chains to cater to their stakeholders resulting in increased profitability.

The platform will have a user-friendly interface for the user of different levels of technology literature with clear and simple instructions to navigate through the platform while utilizing the back-end beyond state of the art technologies.

With regard to Artificial Intelligence: the drone management platform will generate data analytics as a decision support system to the vineyard farmers / managers affecting plant health and productivity.

RESULTS

The results of the project will contribute to the following:

- *A more effective and efficient vineyard management that goes beyond the market indicators*
- *Reduced labor costs and improved safety by automating tasks in a conventionally labor intensive tasks inherent in vineyard monitoring and management*
- *Enhanced data driven decision making in vineyard production*
- *Reduced cost in the whole vineyard production process through utilizing decision support platform*
- *Competitiveness in the market by increased and quality production with reduced costs*