Case Study

SMART SENSORS, APPLICATION WITHIN AGRICULTURAL SECTOR FOR INDUSTRY 4.0

Keywords: *Smart Sensors, Precision/Smart Agriculture, Agricultural Drones, Farm Surveillance*

Background to Case Study

Automation and Data Exchange is one of the smart applications of Industry 4.0 components that can be used to offer smart production of products. The use of smart sensors in everyday life can generate data that following process can provide smart solutions in many business areas. The importance of detecting devices is critical for Industry 4.0 applications and their efficiency is backed by technologies such as that of wireless communication, that allow fast and accurate data exchange. This data process and transfer through wireless technology, may sometimes be hindered by the large amount of data produced and the possible data loss, the capacity of battery storage of mobile devices, etc.

Introduction to the Case Study and it's growth within Industry 4.0.

How does the above element and its application support the growth of the SME/ application under study?

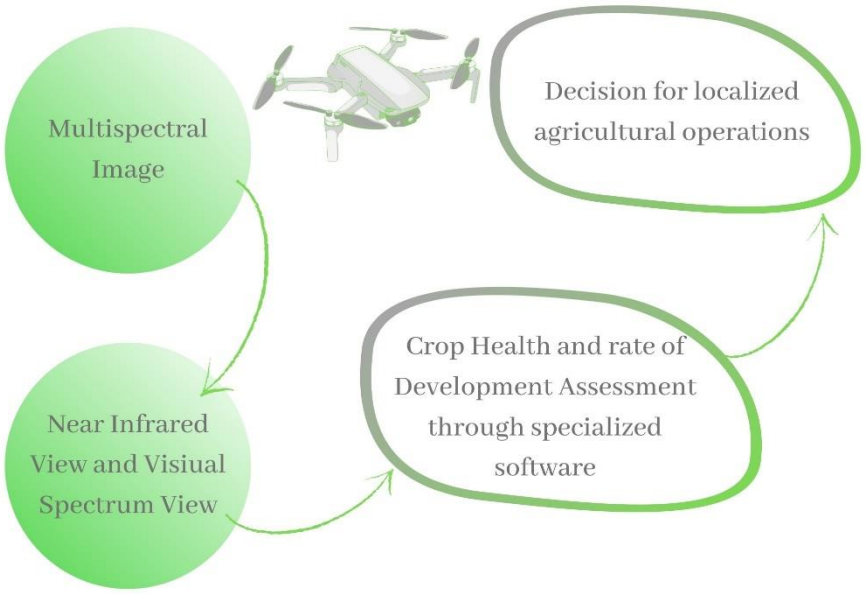
One of the major sectors that sensors are applied are in Smart or Precision Agriculture. The sensors connected with drones, can help farmers produce products with lower costs and more sustainably. Through the information provided by the sensors, farmers can apply pesticides, fertilizers, watering in specific places where is needed, allowing thus for cost efficiency and better protection of farming professionals, since spraying is done by drones at very specific areas of the farm. The sensors collect and send information from the farms, such as leaf area, chlorophyl level, temperature, water potential etc. and the farms receive this information on their mobile phones or their computers. This allows the farmer owners to take decisions on when or where to intervene in order to optimise crop production without spraying or watering the whole farm, but only in specific spots when is needed. This application can save up to 90% of water consumed for agricultural production and 30-40% of agricultural fertilizers and pesticides. One of the major advantages is that exposure of agricultural staff is reduced substantially as spraying is done according to needs and localized.

This technology has the role of a Decision-Support System Tool that is helping entrepreneurs in the agricultural sector take better, faster and more efficient decisions for their farming enterprises.

Project No. 2019-1-PL01-KA202-064936

The Case Study and Industry 4.0 Elements: A Pictorial Overview

The process of Decision Making in Agriculture through the use of sensors



Project No. 2019-1-PL01-KA202-064936

Case Study

THE ELEMENT – TOPIC HEADING
APPLICATION WITHIN XXXX FOR INDUSTRY 4.0

The Element Explored within Industry 4.0 Application.

www.ionos-uav.com

IONOS

IONOS is a Greek company based in Crete that provide integrated services of Unmanned Aircraft Systems (UAVs) designed exclusively for agricultural use. They offer their services at National level. Ionos offers UAV based Precision Farming services in Greece, focusing on precision spraying, spot spraying, and crop index monitoring. Helps farmers to turn into organic products by reducing pesticide usage and handle them in a more secure, safer, and environmentally friendly way. Ionos' team has extensive experience and knowledge in drone piloting, especially in the agri-food sector.

They offer services to farm units that provide answers related to:

***Farm Surveillance**: Irrigation, fertilisation and pesticide control can be monitored through multispectral or hyperspectral cameras on drones.*

***Crop Growth Data Collection System**: The drones are collecting various agricultural indices, such as the normalized vegetation index (NDVI) and normalized red-edge vegetation index (NDRE) by multispectral technology. Data collected are analysed using crop-specific software and information on crop development status is extrapolated. With this information farmers will take right decisions on when and where to fertilise.*

***Spraying and Protection**: IONOS is developing on UAV spraying platforms a specific system of nozzles and pumps that:*

1. Reduce pesticide usage
2. Minimize physical resources usage (water)
3. Minimize drift effect in neighbouring areas
4. Protect farmers and beneficial organisms from spraying drift effect.

Drones are equipped with spraying devices that can carry between 5 to 70 of spraying solution (depending on the area plot and the morphology of the soil). This spraying method is 40 times faster than traditional spraying techniques, saves up to 90% of water and 30-40% of pesticides.

***Fertility and Sowing**: The agricultural drones can save time and offer spot-precision during the operations of sowing and fertilizing the land.*

Project No. 2019-1-PL01-KA202-064936

	Source: https://ionos-uav.com/
Application Target Audience	*The results of the case-study are intended for use by Agricultural Entrepreneurs, Food Industry, Organic Farming Sector*
Resources Used:	*https://en.wikipedia.org/wiki/Virtual_reality* *https://en.wikipedia.org/wiki/Fourth_Industrial_Revolution* *https://ionos-uav.com/innovation/#spraying-and-protection*
Further Reading:	*References to literature/ white papers/ interviews etc…* *https://www.agprofessional.com/article/artificial-intelligence-will-change-farm-machinery-ownership?fbclid=IwAR1g7v2LX9N7WzeCMGMM2T-JBjDigoGW5Lya4bMyTDMO5UOKwsq0pziQIMQ* *https://airdronecraze.com/smart-farmers-using-drones/?fbclid=IwAR30AYqfBPpB2Gtn_CuyyLVW96JKjR06wnKTe4TF5DNU7HPYgIJRxOxmedU* *https://www.facebook.com/IonosBringingTheFuture/videos/755872868178843* *https://www.instagram.com/p/CAJIhh_AD_Z/* *https://www.facebook.com/2313752605569134/videos/657435714839491* *https://www.facebook.com/2313752605569134/videos/149542549614285* *https://www.newshub.gr/el/agronews/stin-kriti-i-proti-panellinia-efarmogi-dolomatikon-psekasmon-me-drone?fbclid=IwAR1XX63tWU-XbldBxIz_2v-UST0Yj0DFjQaZTv2JFFLMOJrbXIWq3XQ06Uw* *https://www.facebook.com/2313752605569134/videos/2488294851246222* *https://www.youtube.com/watch?v=l44o8vJcaDE&feature=youtu.be&fbclid=IwAR3EtJhgRxHeGRqBM0NA_IOitpdWnI8QyPAb_btmCVOm7W9aHAKn_w_Wzr4Y*

Project No. 2019-1-PL01-KA202-064936