

VITALISING ICT RELEVANCE IN AGRICULTURAL LEARNING

**Developing a smart ICT solutions in agriculture,
design challenges**

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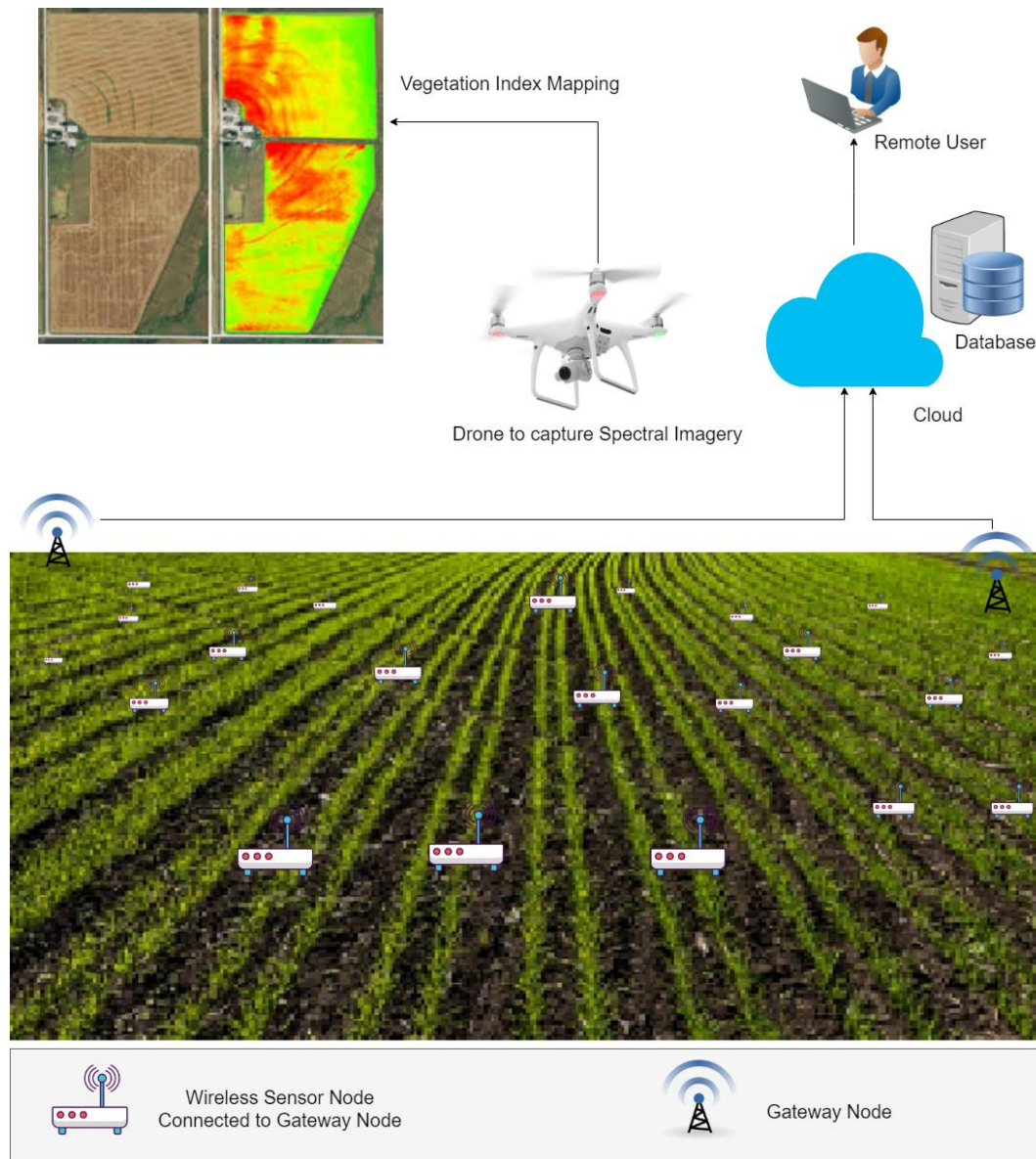


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Developing a smart agriculture solutions

- Infrequently the smart agriculture is a fashion.
- Not every solution for agriculture will suit your needs.
- Almost, the smart solution is custom made.
- First, define what you want? Sometimes, you can lose money and time because of fashion?
- Do not forget the time is “nonrenewable” resource.
- The optimization is never solved problem, but we should do our best to be as much as possible near to optimal solution (even in math).

Different ways to solve one problem?

- Determination nitrogen parameter into crop? Different way to solve a problem?



By drone



By android



By hand held meter



Manually

Steps in developing

- **Decide analytically do you need PA (Precision Agriculture) system?** Do the SWOT analyze and draw out the conclusions and decisions.
- **Define your goals and purposes?** Every farm has priorities. If your farm is in dry climate area then, soil humidity monitoring could be your primary goal. The key goals you want to achieve will ultimately determine the rest of the project – from the sensor's structure to the software architecture. Start from one priority.
- **Decide on the data transfer technology?** Transfer automatically or manually? Raw data or rare data? Near, far? Indoor, outdoor? Which technology to use for data transfer, from Serial till WPLAN.

Steps in developing...

- **Determine the key power sources?** The data travel distance is also important because it directly impacts the sensor's battery life. You can manage power consumption by regulating the frequency of data transfers, or transfer fewer amounts of data. One way or the other, power consumption and power sources will require preliminary estimations.
- **Estimate the frequency of data collection?** Power usage and sensor life will also depend on the frequency of data collection. How frequently does the data you need have to be collected in order to deliver value?

Steps in developing...

- **Consider sensor specification?** Select a proper sensor. The selection of the sensor is very expert job from span till housing. Consider that most of measurements are “physiological”.
- **Consider self-calibration?** Usually, the design skip this point, but how you will know that your sensor is sending proper value. As example, PH measuring.
- **Make mini-model and test the system?** Usually in laboratory or “mini garden” condition you should to do mini-test system. System should operate on models.
- **Install system on the spot?** It is a hard work, not only electronics or ICT based, you need mechanical, civil engineering, masters.
- **Test work on the spot?** Do testing procedures. Do not skip “the worst case” testing.

Conclusion

Although precision agriculture is challenging job you should do optimal and feasible design of your business, and your time. For this you need knowledge from economy, agronomy, computers and quality of life.

Have in mind:

“It's really hard to design products by focus groups. A lot of times, people don't know what they want until you show it to them.” — Steve Jobs

The wheel of technology is always moving forward...

References:

[1] Uferah Shafi et al., Precision Agriculture Techniques and Practices: From Considerations to Applications, Sensors 2019, 19, 3796;

doi:10.3390/s19173796

[2] <https://www.mobindustry.net/6-steps-for-creating-an-agriculture-app-for-a-farm-business-popular-features/>

Thank you !



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