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IOT Based Smart Farming

IOT Architechture And Protocol

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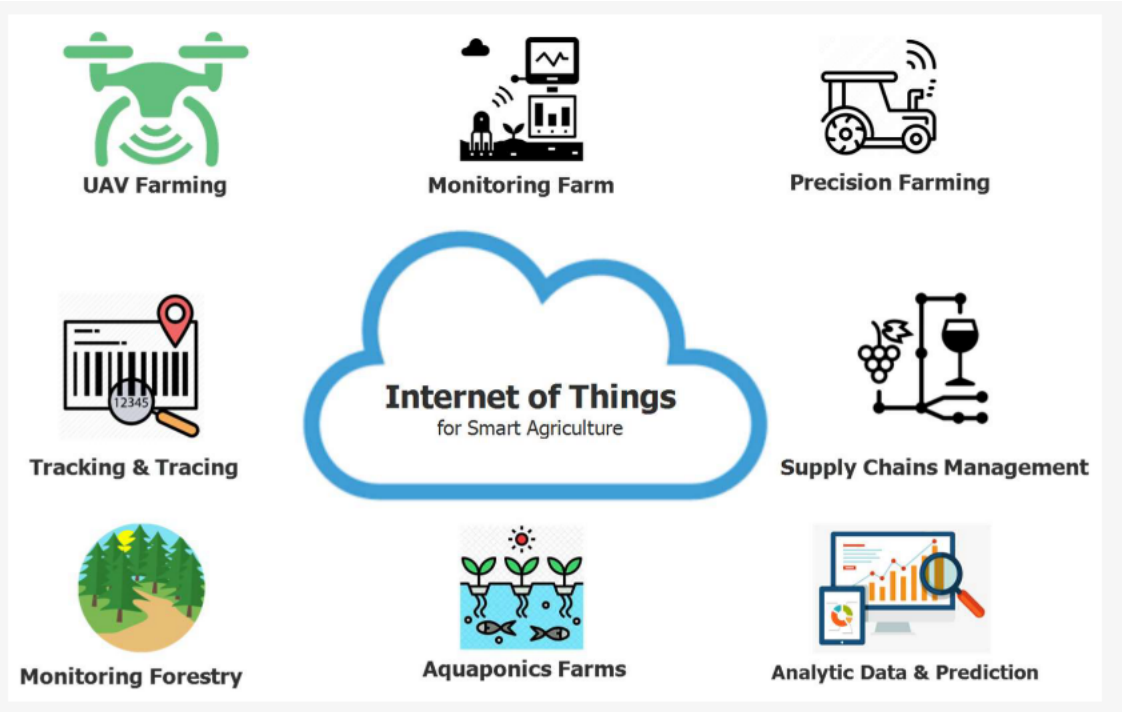
Sustainable Farming Methods



SMART FARMING

Summary

Internet Of Things is a revolutionary technology that represents the future of communication computing. The area of implementation of IoT is vast and can be implemented in every field, One such field is namely Smart Farming. Nowadays, the digital transformation of the agricultural sector is considered a priority in order to face the numerous challenges presented in the fields.Smart farming systems can thus provide farmers meaningful real time environmental data from the cultivation fields which will therefore boost competitiveness and profit.

Traditional Farming and Smart Farming are very different from each other in every way. In Traditional Farming old methods are used where the demand for crops is not pre-assessed and farmers fall into traps of selling their crops for lower price. Whereas using Internet of Things (IoT) which is a large communication network involving a vast number of distributed devices around the network,It helps to recognize and notify users instantly about real-time events happening in the fields and improves crop yielding and provide better production.

Smart Farming Architecture

In the context of Smart Agriculture, the IoT can be described as a large set of technologies and research disciplines oriented to support the agricultural sector, through the deployment of new data-oriented systems comprised of sensors, actuators, network connectivity. Based on this The Smart Farming Architecture can be divided into 4 layers.

1. **Perception Layer**, - It is composed of devices which interact with the environment and gather data from it and can be used to make sense of the environment.

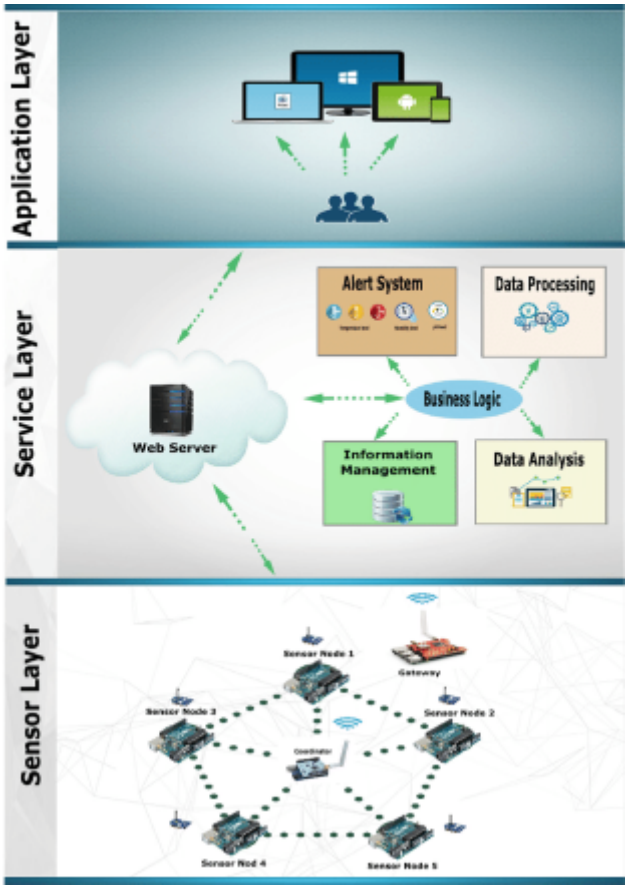
2. **Network Layer** - Allows information exchange among devices and the Internet, with possible local processing.Wireless Sensor Networks (WSNs) is the main Protocol for the IoT application.

3. **Service Layer** - It involves processing and analysis of the collected data

4. **Application Layer** - This makes the application functionalities accessible to the end user (i.e., the farmer).

Since the agricultural sector is characterized by unpredictability, heterogeneity and complexity, it can be better understood by monitoring, measuring and analyzing its physical parameters. This is made possible by the adoption of IoT.

Architectural Layer

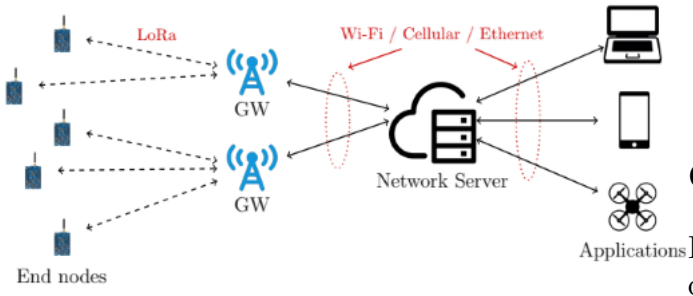


Network Protocol

In the context of Smart Agriculture, the IoT can be described as a large set of technologies and research disciplines oriented to support the agricultural sector, through the deployment of

new data-oriented system comprised of sensors, actuators, network connectivity, cloud-oriented platforms, and so on.

Local networks, belonging to the network layer and typically including nodes equipped with sensors and/or actuators, are generally organized as Wireless Sensor Networks (WSNs). This is the general protocol which is used in IoT based smart farming.



Challenges

The implementation and maintenance of a monitoring system in precision agriculture faces several challenges:

- The greatest challenge is for sensor nodes to achieve efficient and continuous operation for a long time in a natural environment, while taking into account the climate change and wildlife interventions.
- Next Big challenge is regarding the operation of a crop monitoring system with WSN and IoT technologies include the limited computational capabilities of sensor nodes.
- Client and societal acknowledgment is another biggest problem.The reception of keen innovations will without a doubt be very difficult to be easily adapted by farmers.

Conclusion

Farming can be made more efficient and accurate with the implementation of IoT device. IoT can be used in different domains of agriculture. Electricity and water are the main domains in which it can be applied.Farmers can take advantage of the potential of IoT market for agriculture by installing smart technologies to increase competitiveness and sustainability in their productions. Thus the rapid growth of population forces farmers to meet the demand by implementing agricultural IoT solutions in a prosperous manner.