

Wireless Soil Moisture Sensors and IOT

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Abstract- Soil wetness plays a key role within the lifetime of the plant. Nutrients within the soil resolution offer the plant with the food it has to grow. Water is additionally essential for regulation plant temperature through the method of transpiration. Plant root systems square measure higher developed once growing in dampish soil. The amount of latest productive land which will be brought underneath production is restricted. In several nations, the necessity to feed a growing population is goading associate degree intensification of agriculture finding ways in which to grow higher yields of food, fuel, and fiber from a given quantity of land, water, and labor. This unit describes the physical and environmental factors that limit crop growth and discusses ways in which of minimizing agriculture's in depth environmental impacts. Soil wetness sensors live the meter water content in soil. measure soil wetness is vital for agricultural applications to assist farmers manage their irrigation systems additional with efficiency. the net of things (IoT) is that the inter-networking of physical devices (also named as "connected devices" and "smart devices"), buildings, and alternative things embedded with natural philosophy, software, sensors, actuators, and network property that change these objects to gather and exchange knowledge.

Keywords: Internet of Things, Wireless Sensor Network, Mesh, Star, Cluster.

I. INTRODUCTION

We focuses on the WSN, Soil wet detector and IOT associated with WSN. A wireless detector network may be a wireless network consisting of spatially distributed autonomous devices victimisation sensors to observe physical or environmental conditions. Soil wet plays a key role within the lifetime of the plant. Nutrients within the soil resolution give the plant with the food it must grow. Water is additionally essential for control plant temperature through the method of transpiration. IOT is that the huge network of devices connected to the net, together with sensible phones and tablets and virtually something with a detector thereon – cars, machines in production plants, jet engines, oil drills, wearable devices, and more. These “things” collect and exchange information.

II. Wireless Sensor Network

Engineers have created WSN applications for areas together with remote observance. Remote observance covers a good vary of applications wherever wireless systems will complement wired systems by reducing wiring prices and permitting new forms of mensuration applications. Remote observance applications include:

- Environmental monitoring of air, water, and soil
- Structural monitoring for buildings and bridges
- Industrial machine monitoring
- Process monitoring
- Asset tracking

A) Components Of WSN

A WSN node contains many technical elements. These embody the radio, battery, microcontroller, analog circuit, and detector interface. once victimisation WSN radio technology, you must make important trade-offs. In battery-powered systems, higher radio data rates and more frequent radio use consume more power. The second technology consideration for WSN systems is the battery. In addition to long life requirements, you must consider the size and weight of batteries as well as international standards for shipping

batteries and battery availability. To extend battery life, a WSN node periodically wakes up and transmits data by powering on the radio and then powering it back off to conserve energy. WSN radio technology must efficiently transmit a signal and allow the system to go back to sleep with minimal power use. This means the processor involved must also be able to wake, power up, and return to sleep mode efficiently.

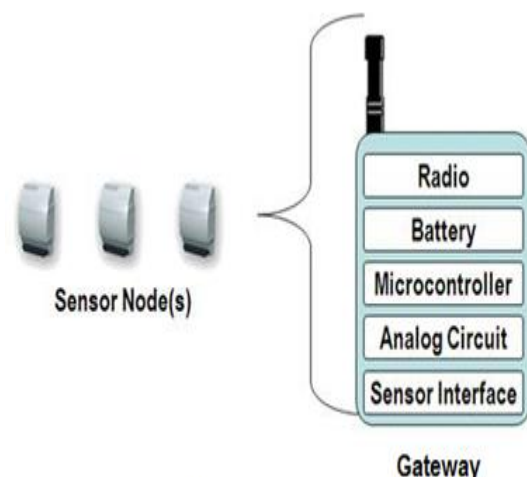


Figure 1. WSN sensor node components

B) Network Topology for WSN

WSN nodes are typically organized in one of three types of network topologies. In a star topology, each node connects directly to a gateway. In a cluster tree network, each node connects to a node higher in the tree and then to the gateway, and data is routed from the lowest node on the tree to the gateway. Finally, to offer increased reliability, mesh networks feature nodes that can connect to multiple nodes in the system and pass data through the most reliable path available.

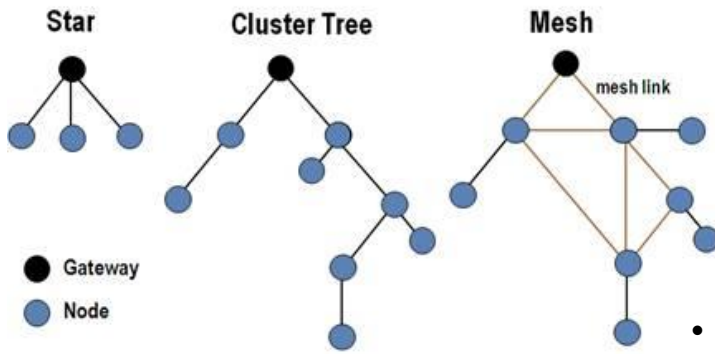


Figure 2. Common WSN topologies

III. Soil Moisture Sensor

Soil moisture is a key variable in controlling the exchange of water and heat energy between the land surface and the atmosphere through evaporation and plant transpiration. As a result, soil moisture plays an important role in the development of weather patterns and the production of precipitation. There are several soil moisture sensors available in today's electronic world, Like MicaZ Mote, VH400, GS1, GS3, 10HS.

A) VH400 Soil Moisture Sensor

VH400 soil moisture sensor probes enable precise low cost monitoring of soil water content. Probe measures the dielectric constant of the soil using transmission line techniques, it is insensitive to water salinity, and will not corrode over time as does conductivity based probes.



Figure 3. VH400 soil moisture sensor

VH400 probes are small, rugged, and low power. VH400 offer a rapid response time. They can be inserted and take an accurate reading in under a second.

- **Soil moisture sensor features**

1. Extremely low cost with volume pricing.
2. Small size.
3. Consumes less than 7mA for very low power operation.
4. Measures volumetric water content(VWC) or gravimetric water content(GWC).
5. Probe does not corrode over time.

- **Soil moisture sensor applications**

1. Irrigation and sprinkler systems.
2. Moisture monitoring of bulk foods.
3. Rain and weather monitoring.
4. Environmental monitoring.
5. Water conservation applications.

IV. IoT and WSN

IoT are often refers to the interconnection of unambiguously identifiable embedded computing-like devices at intervals the prevailing net infrastructure. On the opposite hand WSN treated as self-organizing, multi-hop networks of wireless detector nodes accustomed monitor and management physical phenomena. the concept of net of things was developed in parallel to WSNs. The term net of things was devised by Kevin Sir Frederick Ashton in 1999 Associate in Nursing refers to unambiguously identifiable objects and their virtual representations in an "internet-like" structure. These objects are often something from massive buildings, industrial plants, planes, cars, machines, any reasonably product, specific elements of a bigger system to people at large, animals and plants and even specific body elements of them.

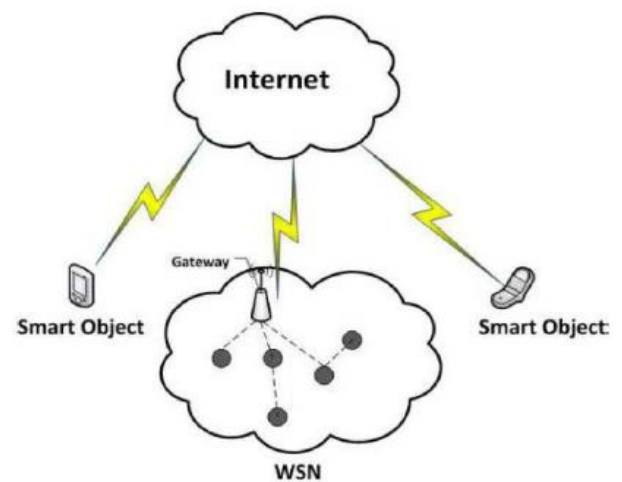


Figure 4. IoT and WSN

A landslide discovery system makes use of a wireless detector network to detect the slight movements of soil and changes in varied parameters which will occur before or throughout a landslide. Through the info gathered it's going to be potential to understand the approaching incidence of landslides long before it really happens. "Things", within the IoT sense, will check with a good form of devices like implants, chip transponders on cattle, electrical clams in

coastal waters,automobiles with integral sensors, DNA analysis devices for environmental/food/pathogen observance,or wet and humidity assortment of soil.

V. CONCLUSION

Managing root zone soil wet is important to optimum crop growth. correct management of soil wet permits correct management of nutrients and alternative inputs. trendy sensing and networking technology permits machine-controlled following of soil wet. Soil wet are often managed through irrigation by keeping water content between volume unit and an outlined allowable depletion.By creating the acceptable use of recent techonology as mentioned higher than like WSN and IoT we are able to illustrate the humidity and wet of soil,So that it affects to production of crops.

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