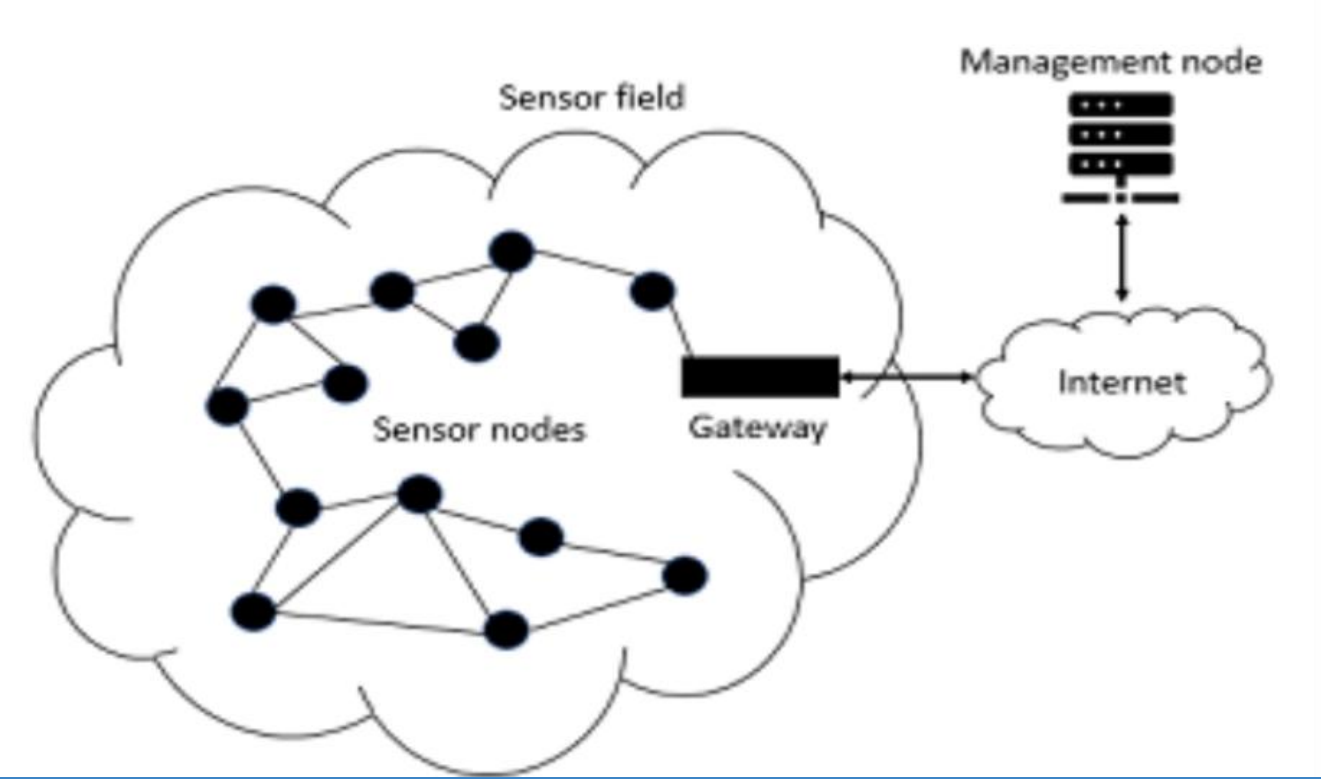
SUBJECT: WIRELESS SENSOR NETWORKS

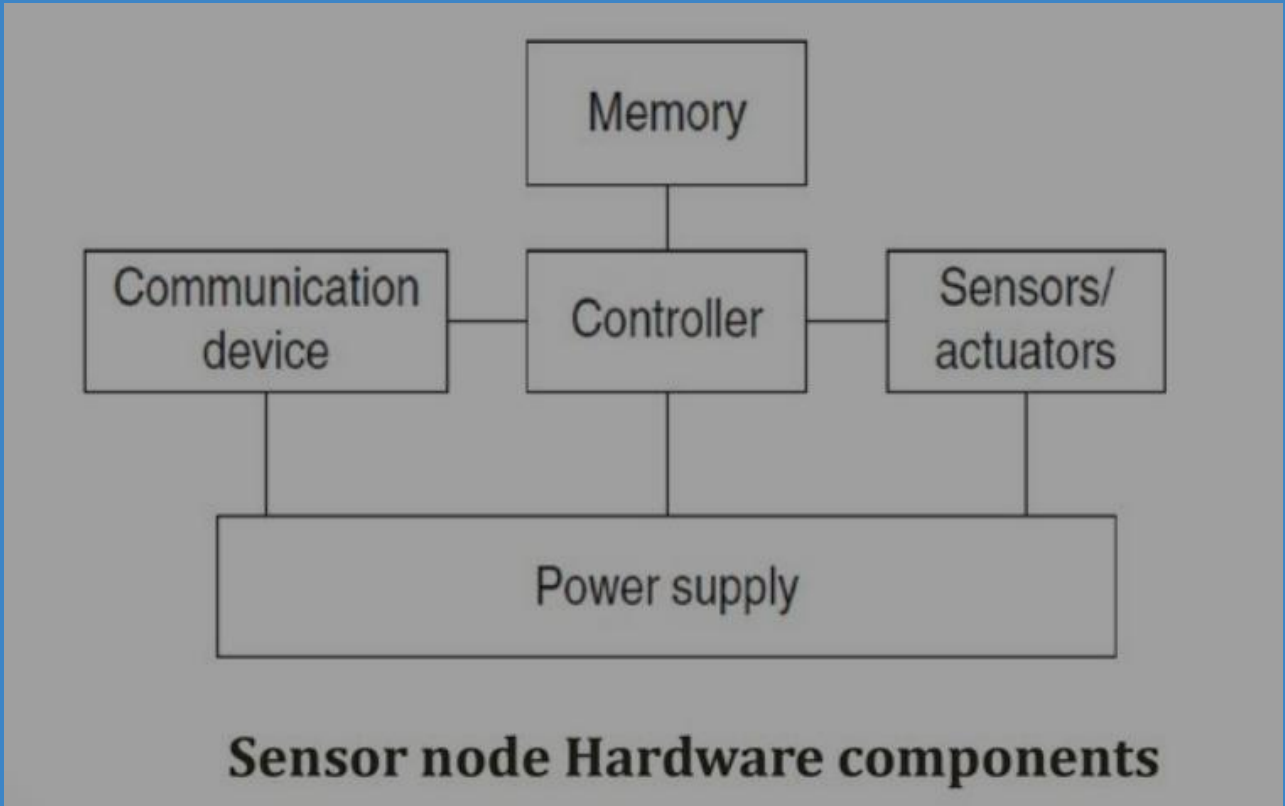
Single-Node Architecture,Hardware Components and Design Constraints

Elementrix Classes

Wireless Sensor Network



Single Node Architecture



Sensor node Hardware components

A single-node architecture in a Wireless Sensor Network (WSN) typically consists of a sensor node that includes the following **hardware components**:

- **Controller:** A microcontroller or a microprocessor that is responsible for processing data, making decisions, and controlling the other components of the node.
- **Sensors/Actuators:** Devices that collect data from the environment and/or control physical processes. They can include temperature sensors, humidity sensors, light sensors, accelerometers, etc.
- **Communication Device:** A wireless transceiver, such as a Zigbee or RF module, that enables the node to communicate with other nodes or a central control unit.

Memory: A non-volatile memory device, such as flash memory or an EEPROM, that stores data and programs.

Power Supply: A battery or other power source that provides power to the node.

Design Constraints:

- **Power consumption:** limited battery life is a major constraint, so power efficiency is critical.
- **Cost:** sensor nodes must be inexpensive to manufacture and deploy in large numbers.
- **Size and weight:** sensor nodes must be small and lightweight for easy deployment and mobility.

- **Reliability and robustness:** sensor nodes must be able to function correctly in harsh environments and maintain data accuracy.
- **Communication range:** limited communication range may limit the overall coverage and functionality of the network.

पढ़िए और पढ़ाइये

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