



IOT BASED AUTOMATED GREENHOUSE WITH GSM TECHNOLOGY

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Abstract: Nowadays automation is considered as an essential feature in every field. It helps people to do their work without much human intervention. Therefore, even a person who doesn't have much knowledge in a particular field can also perform the task with the support of an automated system. Automation is applied in Agriculture as well, particularly in greenhouse automation. Parameters like temperature, humidity, light, and soil moisture are monitored and interventions are automated to maintain optimal plant quality and productivity. The aim of this work is to build an automated greenhouse with the support of the Internet of Things (IoT) and GSM technology. The required level of the above parameters are recorded/stored in the system first. Then real-time levels of those parameters are read and if the levels are below the required level, steps are taken to automatically increase the levels. In the event that the parameters mentioned surpass the predetermined thresholds, the system will initiate actions aimed at reducing them automatically. This involves the automated control of appliances, including fans, sprayers, artificial lights, and water pumps, which are managed by the Arduino system to restore the parameters to their desired levels. The coordinated management of these variables, facilitated by Arduino and IoT technologies, creates a stable and controlled environment for the plants. This careful regulation of environmental conditions directly contributes to high-quality plant growth, increased yields, and improved crop quality, making it an invaluable tool for greenhouse farming. IoT enhances the control and monitoring, enabling remote real-time greenhouse supervision through both an Android application and a web interface. The main goal of GSM module is to build a monitoring system in which a GSM module transmits levels of temperature, humidity, light intensity, soil moisture, and the status of appliances (fans, sprays, artificial lights, and water pump) connected to the system. Furthermore, the GSM modules provide the capability to remotely manage the connected devices, allowing manual intervention via SMS when required, ensuring the greenhouse parameters remain within the acceptable range conducive to plant growth.

Keywords: Arduino, Automation, ESP32, Greenhouse, GSM, IoT, Robotics