IOT BASED PLANT DISEASE FORECASTING

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***ABSTRACT*:** This paper present, Plant disease forecasting system which is management system of the occurrence of plant disease and preventing plant disease by suggesting pesticides to the farmer. It has been demonstrated that the change in environmental conditions are affecting on plant and cause to different diseases. Temperature, Humidity and moisture content in the soil are main factors which is responsible for growth of plant. The system which detect environmental conditions and accordingly it send message to the farmer about possibility of particular disease and pesticide for that disease through Wi-Fi (ESP8266). Also detect moisture level of the soil to turn ON/OFF motor automatically.

Keywords: - **humidity, moisture sensor, Fertilizers.**

INTRODUCTION

India is agricultural country. Over 70 percent of rural households depend on agriculture. Agriculture is an important sector of Indian economy as it contribute about 17% to the total GDP and provide employment to over 60% of the population. The main factor which reduce economic growth and productivity is the impact of disease on plant. By overcome this problem we can increase productivity. The impact of disease mostly because of environmental conditions. So we decide to implement a system which eliminating this problem.

Usually farmers spray pesticides or bactericide (Fertilizer) as per market or by discussing among other farmers instead of looking for actual weather conditions. This is not accurate method for preventing plant which results in losses due to the disease. Also farmers always cannot understand what exact diseases are there on plants. So it is very important to know about all the diseases and their conditions. This system helps farmers which disease found on plant and which fertilizer should be used for the disease. This system is very helpful to farmer to increase productivity.

The purpose of disease forecasting is to predict the possibility of disease and preventing the plant to increase productivity. Weather conditions may determine the presence of the disease on the plant through their effects such as Damping off, early blight etc. The system sense humidity and temperature using DHT11 sensor and gives feedback to the controller. Then controller compares given temperature and humidity values with reference values and gives result, is there any disease or not? If any disease occurred it send information back to the farmer through SMS. Also detects moisture contents in the soil using soil moisture sensor. If the value of moisture is below reference value then controller will automatically turn ON the pump for some time.

LITERATURE REVIEW

The main factors that control growth and development of diseases are temperature, light and water. Climate affects all life stages of the pathogen and host and clearly poses a challenge to many pathosystems. The environmental change, especially when combined with pathogen and host introductions, may result in unprecedented effects which cause damage of plant and also decrease productivity of plant. [1].

A change in temperature may favor the development of different inactive pathogens, which could induce an epidemic. Due to changes in temperature and precipitation regimes, climate change may alter the growth stage, development rate, pathogenicity of infectious agents, and the physiology and resistance of the host plant [3]. Temperature is one of the most important factors affecting the occurrence of bacterial diseases such as Ralstonia solanacearum, Acidovorax avenae and Burkholderia glumea [4].

Increased CO2 levels can impact both the host and the pathogen in multiple ways.

Pathogen growth can be affected by higher CO2 concentrations resulting in greater fungal spore production [3].

Early blight caused by Alterrnaria solani is one of the world's most catastrophic diseases incurring loss both at pre and post-harvest stages in tomato. Early blight of tomato is economically the most important disease of tomato in USA, Australia, UK and India, where significant reductions in yield (35% to 78 %) have been observed [6]. solani caused yield loss of tomato fruit by 78% at 72% disease intensity and each 1% increase in disease intensity reduced tomato yield by 1.36% [7].

METHODOLOGY

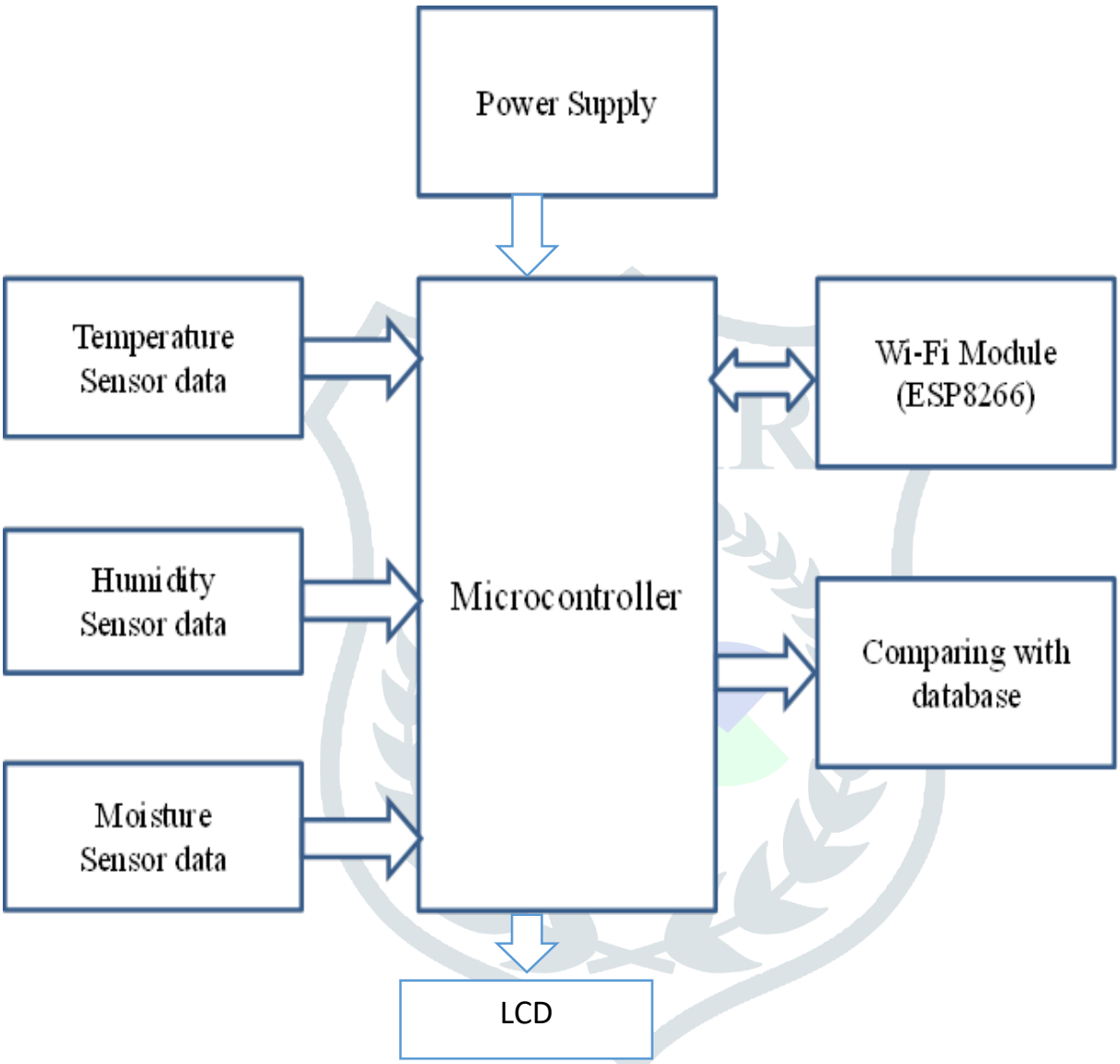

fig. architecture diagram

There are DHT11 and moisture sensors are used in this system to detect the enviourmental condition. The sensors are act as input device to the system. The moisture sensor consist of two electrodes and the electrodes are place inside soil to detect moisture contents. soil moisture sensors measure the volumetric water content by using some property of the soil, such as electrical resistance and dielectric constant. The DHT11 temperature and humidity sensor calibrated with the digital signal output. It has integrated with the 8 bit micro controller. 4 bit are used for the humidity and 4 bit used for temperature value. The moisture holding substances are present in the DHT11 sensors which detect the moisture level. The DHT11 sensors include resistive element, it is used for negative temperature coefficient (NTC) value. Then this value is send to NODMCU controller. The controller compare this value with reference value which already has put in the controller. Then display the result on the LCD and send the SMS to the

farmer by using WIFI module (ESP8266). If the value of moisture level is below reference value it will turn ON the motor automatically.

CONCLUSION

This prototype has been successfully tested and driven according to the predefined objectives and goals and it gives satisfactory results for the same. The need of detecting environmental condition for plant disease forecasting has been met. Prototype can serve as a base for the upcoming trends in the field of Agriculture. This system will be further modified and develop it will become beneficial in the area of agriculture.

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