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Smart Technique for Monitoring Street Light using WMN

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Abstract: ***There are millions of streetlights to provide proper illumination during night time each street light has a life span and apart from that there is physical damage, damage due to wind, accidents etc. these days there is a process that the public launches a complaint about any failure or the government officials have periodic maintenance in the evening and note down the issue in the particular pole and then get it rectified on the upcoming day event . getting information about every street light daily basis is very tedious .To solve the delay of identifying and rectifying the units we are make a mesh kind of network with Wi-Fi module .each light pole will have ESP8266 with in each will act as server and client all of the street lamp will communicate with each other and confirm their presence or activeness first***

Keywords: tilt sensor, Humidity sensor, GSM, Light Dependent Resistor [LDR], Node mcu, LCD

I. INTORDUCTION

Basically, street lighting is one of the important parts of a city's infrastructure where the main function is to determine the city's streets during dark time of the day. Previously, the number of streets in the town and city is very small. Therefore, the street lamps are very simple but with the development of urbanization, the number of streets increases rapidly. There are several factors need to be considered in order to design a good street lighting system such as night-time safety for community members and road users, provide public lighting at cost effective, the reduction of crime and minimizing it is effect on the environment. The steet lights will become damaged due to accident ,wind, rain it causes more problem to public while travelling in night time .poor in illumination blown of bulb pole fallen sometime identifying these fault will take more time because number of pole is more and to identify the fault they should visit night time and monitor the all pole condition To solve the delay of identifying and rectifying the units we are going to make a mesh kind of network with Wi-Fi module it is going to be a Wi-Fi mesh. Each light pole will have a Wi-Fi module that will have ESP8266 and each will act as server and client all of the street lamp will communicate with each other and confirm their presence or activeness first. Each node will interact with each other on a particular interval. Each node will have data of each pole lighting with the pole number. Each beside pole will have LDR(light dependent resistor) to monitor the amount of lumens that is generated by the lamps beside them with the pole number. I needed each poles bulb unit casing temperature and humidity can also be monitored to identify any leakage of water inside the case .Because any damaged pole will not have any power then the beside pole will lose the communication while pinging the damaged pole and intimate the status to. For a sample we can have a android application where you can see the status through GSM we can receive a message.

II. LITRATURE SURVAY

A. B. K. Subramanyam worked on intelligent wireless street light control and monitoring system, which integrates new technologies, offering ease of maintenance and energy savings. Using solar panel at the lamp post By using LDR it is possible to save some more power and energy, and also we can monitored and controlled the street lights using GUI application, which shows the status of the lights in street or highway lighting systems.

B. P. Nithya et al. [3], in their work on Design of Wireless Framework for Energy Efficient Street Light Automation suggested an Intelligent management of the lamp posts by sending data to a central station by ZigBee wireless communication. With the suggested system, maintenance can be easily and efficiently planned from the central station, allowing additional savings.

C. Srikanth M et al. [4], in their work on ZigBee Based Remote Control Automatic Street Light System. This streetlight control system helps in energy savings, detection of faulty lights and maintenance time and increase in life span of system.

D. Anila Devi Y et al.[5], worked on GSM Based Remote Control System of High Efficiency Intelligent Street Lighting System Using AZigbee Network of Dev Now a day identifying and rectifying the damage occurred to street light due to accident,

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wind, rain fall is more difficult. Getting information about street light is very tedious as it not possible to check proper function of street light daily basis.

III. OBJECTIVE

The objective of this project is a design an light system which has ability to identify the fault which occur in the pole condition and intimate to the concerned person by sending alert message to reduce the delay .also reduce the man power

A. Propesed Block Diagrm

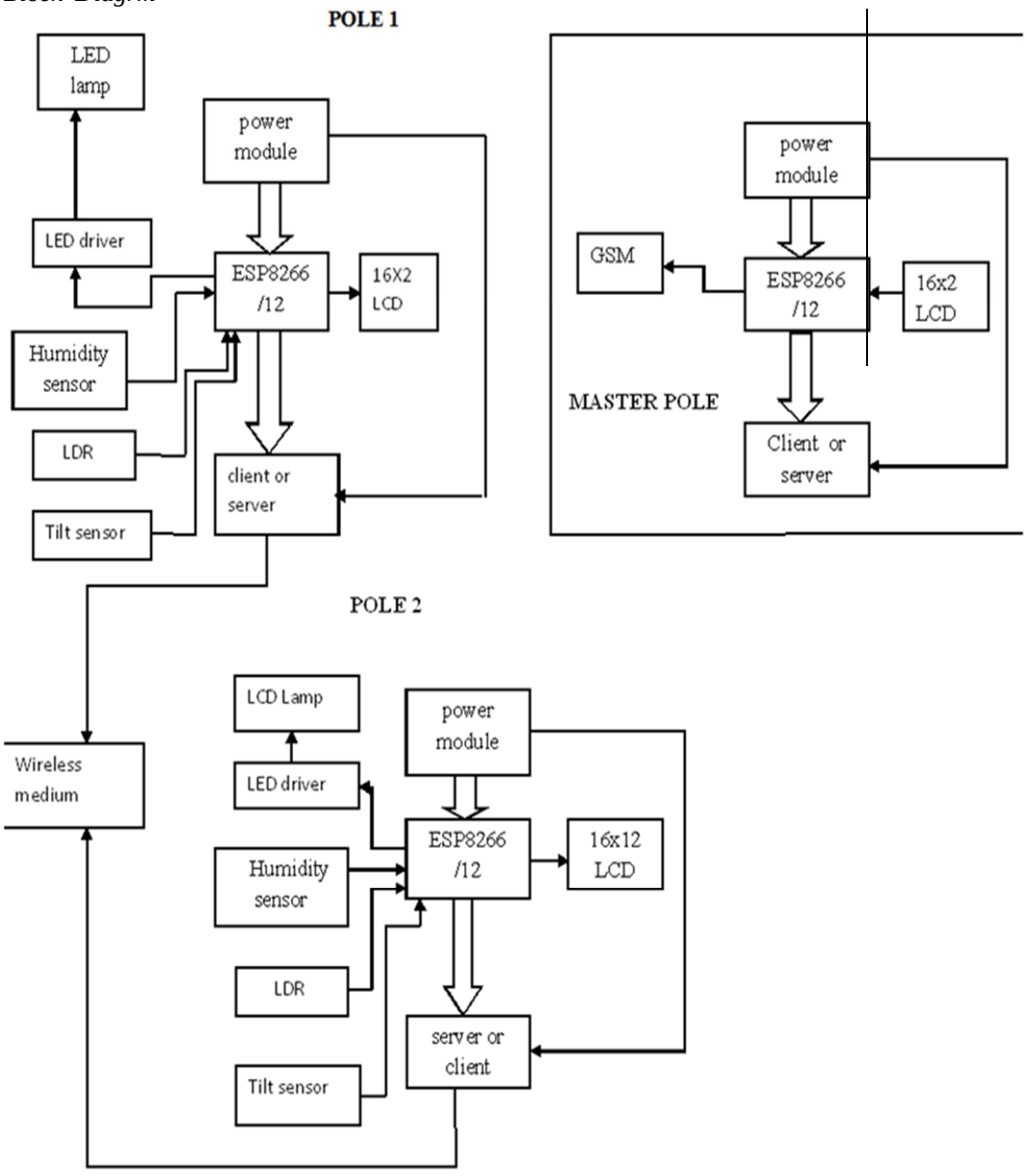

Fig .1 block diagram of system

The system is designed in such a way that in street light we place node mcu ESP8266 in all pole which as inbuilt Wi-Fi system which help to form mesh network along with Tilt sensor ,Light sensor, Humidity sensor ,LCD Display which display the particular pole conditions .In Master pole along with node mcu we place GSM and LCD display Display the will display all pole conditions and it send the message if any error/fault occurred to any pole to concede person. LDR is used as light sensor which is responsible for the ON/OFF status of light. For eg, if light OFF in pole 1 it send the message is to client that pole 1 Light is damaged. As same all sensors will send message depending on the fault.

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B. Flow Chart

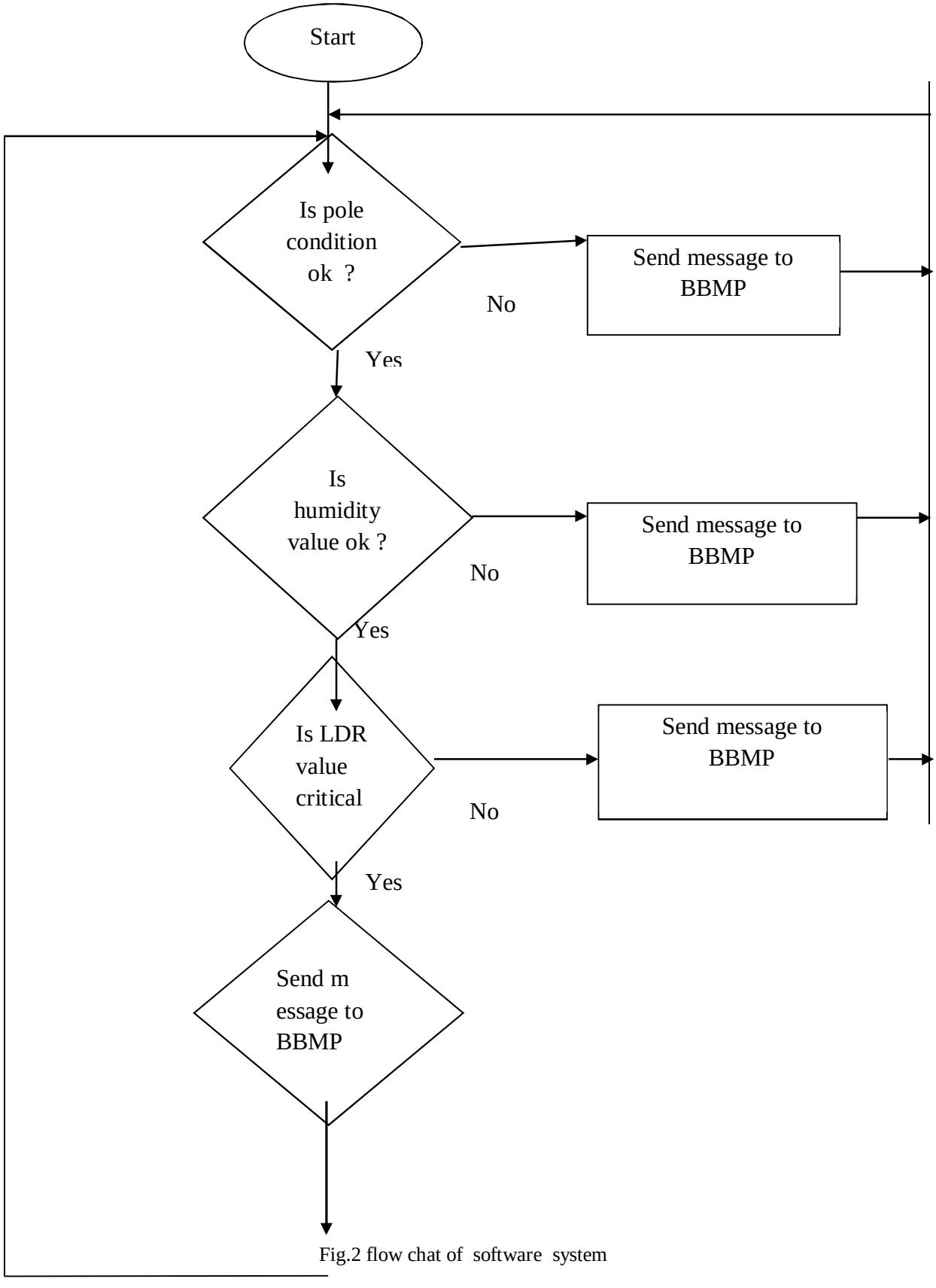

Fig.2 flow chat of software system

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C. Hard Ware

1) Node MCU (ESP 8266)
2) LCD Display
3) Light Sensor(LDR)
4) LED Lamp
5) Tilt Sensor
6) Humidity Sensor
7) GSM Module

D. Soft Ware

1) Flash magic
2) Arduino Compiler

IV. CONCLUSION

This project an Smart system for monitoring faulty street light using wireless mesh network will reduce the delay of identification of fault and rectification .this features the reduce the time consumption and man power to monitor regular base and also increase speed of replacing by carrying appropriate tools. The wireless nature of control system is offered through Wi-Fi which inbuilt in Node mcu

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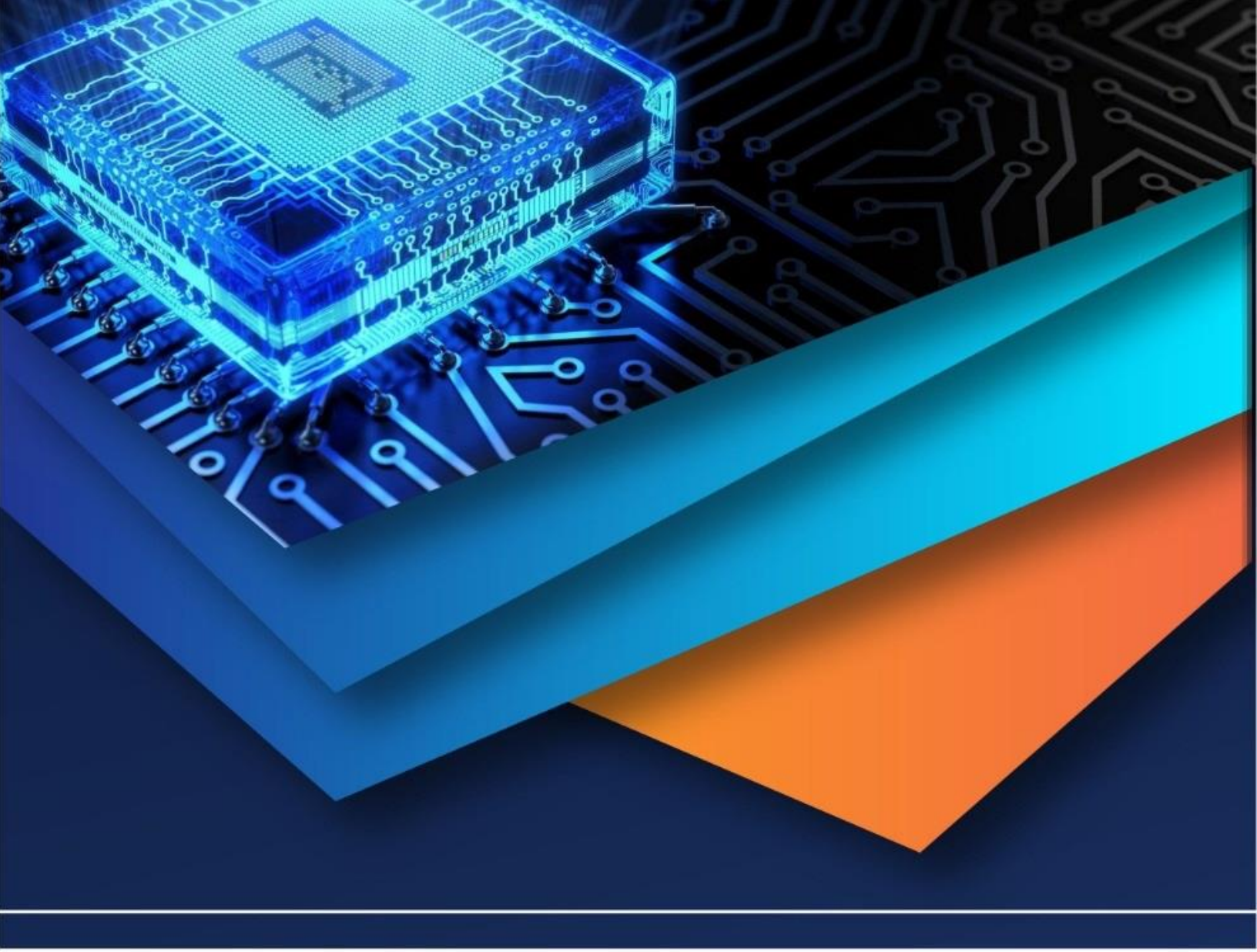

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