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UNIFY STREET LIGHT FAULT DETECTION AND LOCATION TRACKING CONTINGENT ON IOT

[1]G.Kiran, [2]N.Prachi, [3]C.Nikita,[4]J.Snehal,[5]Z.Aishwarya

[1]Assistant Professor,[2,3,4,5]B.E Student

[1]Information Technology Engineering

[1]Anantrao Pawar College of Engineering and Research, Parvati Pune, India

Abstract: A smart city relies heavily on an efficient street lighting system, which plays a vital role in enhancing the functionality and aesthetics of its highways and streets.Effectively handling the power consumption and maintenance of a street light system poses a challenging task, particularly in large countries .If any kind of fault occurred in street light that precise message will send to authorised and sub authorised incharge person through theapplication. In the message we are sending location of light pole and precise fault like damage wire or current flow. We are introducing the application in which administrativelogin will be provided. Message will send in application. After reparing the fault the incharge person have to scan his be RFID Card. RFID scanner will be mounted on thelight pole. RFID reader recharge itself with solar panel. After scanning RFID card the reader will send message in application that fault has been repaired successfully with date and time, name of the person. This project helps to reduce the sloppiness of socialworkers and it is efficient wat to detect faults. The LDR sensor is a light-dependent resistor that changes its Subject to the quantity of available light,it is exposed to.TheGPS module is a device that can determine the location of an object using satellite signals.The Blynk app is a mobile app that can be used to control IoT devices.The RFIDreader is a device that can read RFID tags.The RFID tag is a small device that containsa unique identifier.

I. Keywords

Centralized system, Blynk app, IoT, real-time monitoring, scalability, esp32

II. INTRODUCTION

Street lights are an essential part of our infrastructure, providing us with light at night and making our streets safer. However, street lights can malfunction, which can be a safety hazard. This project proposes to design and develop an IoT-based street light fault detection and alert system that uses an ESP32, LDR sensor, GPS module, and Blynk app. The system will also have a confirmation system that verifies if the repairing person visited the light or not. This will be done using an RFID reader and card. The RFID reader will be mounted on the street light, and the RFID card will be given to the repairing person. When the repairing person scans the card, the ESP32 will record the time and date of the visit. This information can be used to track the progress of the repairs and ensure that all street lights are being maintained properly.This system is a cost-effective and efficient way to detect and repair street light faults. It is also a sustainable solution, as it reduces the need for manual inspection of street lights.

III. LITRATURE SURVEY

Sr.no	Title	Author	Description	Year
1.	IoT Based Smart Street Lighting System	Prashanth. S U Rakshanraj. J A. Maria Chirstina Blessy	This paper present Using Node MCU, IR sensor, LDR Sensor. The LDR Sensor Detect Status Of Street Light. The primary objective of this project is to conserve energy by elevating the light intensity solely upon detecting the movement of an object	2022
2	Auto Streetlight Control with Detecting Vehicle Movement	D.K. Saini	The aim of this paper is to reduce the amount of power lost in streets in the name of street lights. To achieve this, the street lights should illuminate in the presence of any object or vehicle during the night, while remaining switched off during the daytime.	2022
3	Street Light Controlling and Monitoring of Fault Detection using LoRa	N. Sravani Y. Latha G. Nirmala	This paper presents using LoRa By Using LCD, LDR, Solar Panel, Think Speak And LoRa Module. This project Enhancing Swiftly identifying faults is a critical task.nd Based on the characteristics of the application,this study employs two separate model techniques.	2021
4	IoT based Automatic Damaged Street Light Fault Detection Management System	Ashok Kumar Nanduri Siva Kumar Kotamraju G L Sravanthi Sadhu Ratna Babu K V K V L Pavan Kumar	This paper presents by using GSM, LDR, LED and GPS. The goal of the project is to provide control and identification of the damaged street light automatically. Within this system, it verifies the operational status of the street light, determining whether it is switched ON or OFF.	2020
5	Energy Efficiency and Pay-Back Calculation on Street Lighting Systems	C. Subramani S. Surya J. Gowtham Rahul Chari S. Srinivasan J. P. Siddharth Hemant Shrimali	energy management in street lighting is very important in the present day in order to consume only required threshold level of energy thus saving the production of excess Various new techniques are currently employed to conserve energy in street lighting.	2019
6	National Highway Street Light Faulty Detection & Monitoring System	G.Praveen B. Ravi Teja M. Madhu Venkat G. Sai Anvesh	This paper presents By using this system manual on-site works are 100% removed and can be controlled from anywhere through internet(IoT) and it can be operated using 2 modes LDR and IR Sensor. In this system, Wi-Fi has been integrated into the intelligent street lighting infrastructure.. The system is composed of Wi-Fi nodes integrated with light sources based on high power LED diodes.	2019

7	Street Light Monitoring and Control System	Abdul Latif Saleem Raja Sagar R Sachin Datta N S Sachin H S Usha M S	This paper is It is designed to automate the maintenance of street lights and minimize power usage.This paper by using Current Sensor, GSM, LDR, and Microcontroller. to ensure the prompt resolution of individual faults, the aim is to complete repairs within a few working hours instead of extended periods, which could span days or even months.	2015
8	Arm Based Street Lighting System with Fault Detection	V. Sumathi A.Krishna Sandeep B.Tarun Kumar	This paper by using Arm processor, PIR sensor, LDR Sensor, GSM and Fault Detecion. This paper introduces an innovative street light system that incorporates optimized management and efficiency for street lighting.	2013
9	Intelligent Street Lighting System Using Gsm	K.Y. Rajput	With the widespread accessibility of flexible lighting technologies such as light-emitting diode (LED) lamps prevalent everywhere available.the realization of wireless internet connected,rapidly responsive,dependable and energy-conserving street lighting system becomes a reality.The objective of this study is to delineate the Intelligent Street Lighting (ISL) system, representing an initial endeavor to meet the requirements for adaptable public lighting systems.	2013

IV. PROPOESD SYSTEM

This proposed work aims to develop a centralized street light fault detection system using ESP32, Blynk app, LDR, GPS, RFID reader, and battery. The system will be able to detect street light faults, track the location of maintenance personnel, and verify that maintenance personnel have visited the site of a fault.

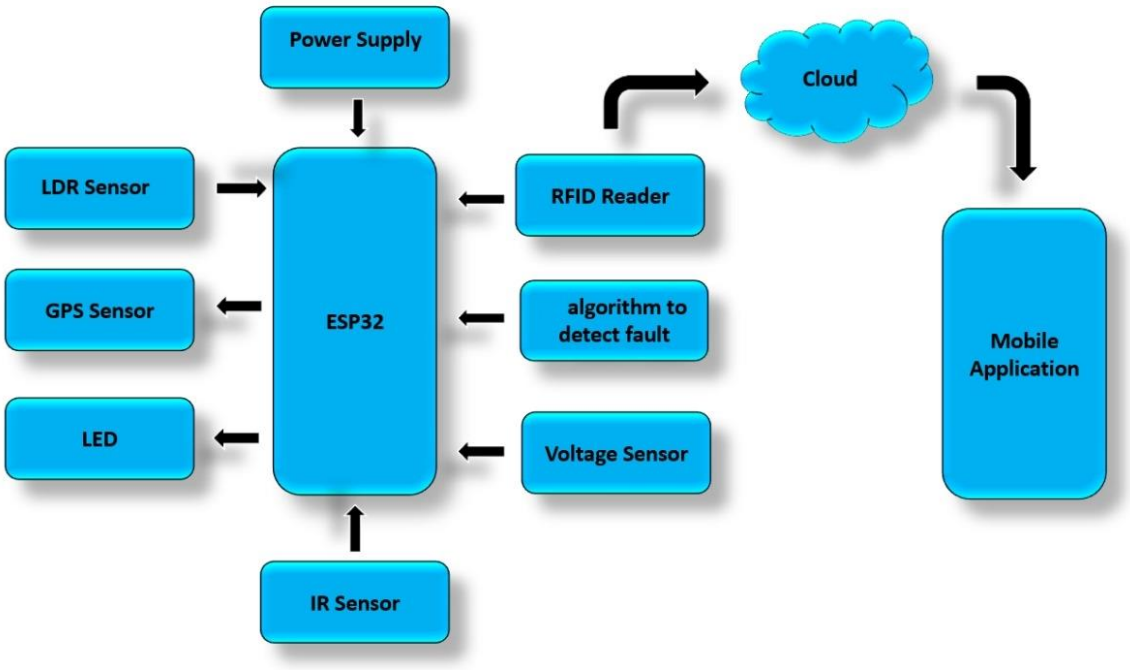

fig.system architecture

The system will consist following components:

ESP32: The ESP32 is a microcontroller that Will be utilized for collect data from the sensors and send it to the Blynk app.
Blynk app: The Blynk app is a mobile app that Will be utilized for display the data collected by the ESP32 and to allow maintenance personnel to interact with the system.
LDR: The LDR is a light sensor that Will be utilized for detect street light faults.
GPS: The GPS module Will be utilized for track the location of maintenance personnel.
RFID reader: The RFID reader Will be utilized for verify that maintenance personnel have visited the site of a fault.
Battery: The battery Will be utilized for power the system when there is no grid power available.

V. Conclusion

The street light fault detection and alert system with automatic light on/off feature is a comprehensive solution that can help cities improve the efficiency and effectiveness of street light maintenance. The system will provide a number of benefits, including reduced street light downtime, improved safety and security, reduced energy consumption and costs, and increased efficiency of street light maintenance.

VI. Future Scope

- **Integration with other smart city systems:** The system could be integrated with other smart city systems, such as traffic management systems, public safety systems, and environmental monitoring systems. This would allow for a more comprehensive and coordinated response to street light faults and other events.
- **Predictive maintenance:** The system could be used to collect data on street light performance and environmental conditions over time. This data could then be used to develop predictive maintenance models that can identify and address potential problems before they cause failures.
- **Energy efficiency:** The system could be used to optimize street light brightness levels based on real-time traffic and weather conditions. This has the potential to result in substantial energy conservation.
- **Public engagement:** The system could be used to provide the public with real-time information on street light status and repair schedules. This could be done through a mobile app, website, or social media.

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