Iot Basedsmart Street Light System

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Abstract- ThisIOT based smart street light system is designed to automate the system to increase the efficiency of an enterprise to perform the working of the street light mainly switching ON and OFF of the street light.The project deals with making a smart street light that would enable itself when it comes in contact with an obstacle i.e. a vehicle for an instance, and turn off when there is nobody around. The system requires an Arduino Uno microcontroller, some ultrasonic sensors and a battery for making the entire idea functional. The ultrasonic sensors that are responsible for the detection of an obstacle would be manually placed on the street light poles, on detection of an obstacle; they would send electrical signals to the central sensor box consisting of our Arduino Unomicrocontroller. The microcontroller that would be powered by a battery source will then eventually turn on the street lights of the location where the obstacle is detected.This electrically generated data can be statistically viewed from the user's mobile device.

Keywords- Internet of things (IOT), Street lights

I. INTRODUCTION

Streetlights are the basic need and assets of an area providing safe roads, inviting public areas, and enhanced security in homes, businesses, and city centers. Street Light Monitoring & control is an automated system designed to increase the efficiency and accuracy of an industry by automatically timed controlled switching off street lights. The main aim of the project is to describe new economical based streetlights. The control system consists of wireless technology. The base server can control the whole city's streetlights by just sending a notification using a network. The main motive behind implementing this project is to save energy. A Street light, lamppost, street lamp, light standard, or lamp standard is a proposed source of light on the side of a road or walkway, which is turned on or lit at a certain time every night. Significant benefits of street lighting include prevention of accidents and increase in safety. Studies have shown that darkness results in a considerable number of crashes and accidents, especially those involving pedestrians; pedestrian accidents are 3 to 6.75 times more prone in the dark than in the day. Street lighting has been found to reduce walker crashes by nearly fifty percent. This project describes a new practical solution for street light control systems. Streetlight system is developed tomonitor and reduce the use of power in town's public street lighting system. It includes a monitoring circuit of street lights and individual lights with network operating protocols. For most kinds of lights, compatible hardware with certain protocols is used.

- Today's Streetlight system is not flexible.
- Most of the controlling are manual, whereas some are automated based on environmental parameters.
- The biggest problem is to handle remote area locations.
- Manual mistakes result in power wastage.

II. PROJECT IDEA

Street lights are the essential factor of any city to make it a smart city. Noticing some of the street light are kept ON in daylight, this solution is introduced.

III. METHODOLOGIES OF PROBLEM SOLVING

Lights contain chips. Chips consistMicrocontroller along with various sensors like CO2 sensor, fog sensor, light intensity sensor, noise sensor and GSM modules for wireless data sending and receiving between concentrator and PC. The data from the chips would get on a remote concentrator (PC), and the PC would also transfer the controlling action to the chip. According to the survey of variation in the intensity of light in the field area, an efficient programming would be done to ensure the least consumption of energy. The emissions in the atmospheres would detect along with the use of energy and any theft of electricity. The research work divides into the following Phases:

- **Research:**

To do a complete field study of a particular location for the existing use of energy, discharge levels, the cost of set up & maintenance, etc. of that area and design energy efficient system.

- **Web Application:**
  - To collect the street light data (IP, Location, Area, City, etc.)
  - To monitor lighting control status.
  - To control the controllers depending upon the light intensity required.

- **Lamp Controllers:**

  - Power on/off/dim the light.
  - Monitor the status of the light.
  - To collect the data from various sensors.

- **Communication Link:**

To establish an efficient path between the controller and PC for bidirectional data transfer.

IV. EXISTING SYSTEM

This system has been developed to control the street light mechanism and to reduce energy consumption in the street light system. These range from controlling a circuit of street lights and/or individual lights with specificballasts and network operating protocols. The switching ON and OFF of the street lights are done by sending and receiving instruction through the wireless network connection. Various protocols have been developed as well as compatible hardware for most types of lighting. Drawbacks of Existing System

1. Today's Streetlight system is not flexible.
2. Most of the controlling is manual. Whereas some are automated based on environmental parameters.
3. The biggest problem is to handle remote area locations.
4. Manual mistakes result in power wastage.

V. PROPOSED SYSTEM

Street Light Monitoring & control is intended to increase the productivity and precision of an system by automatically scheduled control of street lights. This project represents a new cost-effective solution for street light control systems. The control system consists of control circuitry, internet, and electrical devices. The system also contains the client-server tool where a user can directly cooperate with the web-based application to observe the Streetlight. The base server will run a Java Web Application which will maintain whole street light of Country/State/City. Streetlight controller will receive that information, and it will decode and find the particular streetlight which will set using relay circuit, the notification came it will then decode and finds the appropriate

streetlight which needs to put ON/OFF using relay circuit. The entire street light lamps are connected to relay driver circuit. The base server will run a Java application which will maintain the whole Streetlight record of the city.

VI. ARCHITECTURE ULTRASONIC SENSORS

An ultrasonic sensor is an electricdevice that is used to sense certain features of its environments by either emitting and/or detecting ultrasonic emission. It is also capable of detecting motion. Ultrasonic waves are not visible to the human eye. In the electromagnetic spectrum, ultrasonic radiation is the region having wavelengths longer than visible light wavelengths, but shorter than microwaves.
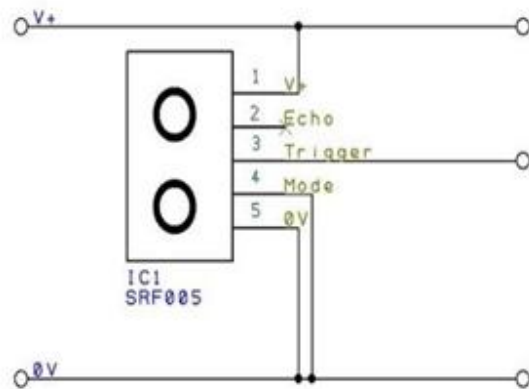

FIG:**Ultrasonic Sensor**

LIGHT DEPENDENT RESISTOR (LDR):

They are light sensitive instruments. They are also named as photoconductors, photoconductive cells or simply photocells. They are composed up of semiconductor resources having maximum resistance. There are many diverse signs used to specify an LDR, one of the most usually used sign is shown in the figure below. The arrow indicates light falling on it. When light falls i.e. when the photons descent on the material, the electrons in the outer band of the semiconductor material are moved to the conduction band.