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QR based automatic damaged street light fault detection management system

Jagrut Tawade

jagrutawade38855@gmail.com

Thakur Polytechnic, Mumbai,
Maharashtra

Ritik Yadav

ritiky181@gmail.com

Thakur Polytechnic, Mumbai,
Maharashtra

Asheesh Yadav

asheeshyadav321@gmail.com

Thakur Polytechnic, Mumbai, Maharashtra

Ritesh Tripathi

riteshtripathi105@gmail.com

Thakur Polytechnic, Mumbai, Maharashtra

Manish Salvi

manishsalvi2000@yahoo.co.in

Thakur Polytechnic, Mumbai, Maharashtra

ABSTRACT

The IoT (Internet of Things) is a promising technology that mainly concentrates on the interconnection of devices or components to one another and the people. Street lights are the basic service that is important for both rural and urban cities over the globe. As the world is moving towards automatics so the project proposed in this paper is based on automatic street lights, which will switch ON automatically when there is dark outside, if there are few lights not working, we can easily get their information by having a QR code scanner on each pole which people can scan and submit the issues which will be directly sent to the local area corporation making it flexible for people to use it easily. Finding the faulty street light automatically is become an important milestone by using this technology. Whereas in this proposed work using QR this light working status is easily captured with minimum manual interaction.

Keywords: IoT (Internet of Things), QR code, Street Light, LDR (Light Dependent Resistor), LED (Light-Emitting Diode)

1. INTRODUCTION

As we see these days technology is growing rapidly, Internet of things is playing an essential role in everyone's regular life. There is a clear increase in the changes being made among the traditional systems, & other general household components, and traditional systems for making a better life automatic street light can be a completely familiar concept in a few years. Our project is based on one such idea, street lights are automatically turned on when it becomes dark and automatically turn off when it becomes bright. If there are few lights not working you can use a QR code on each pole to scan and submit the issue to the local municipality authorities

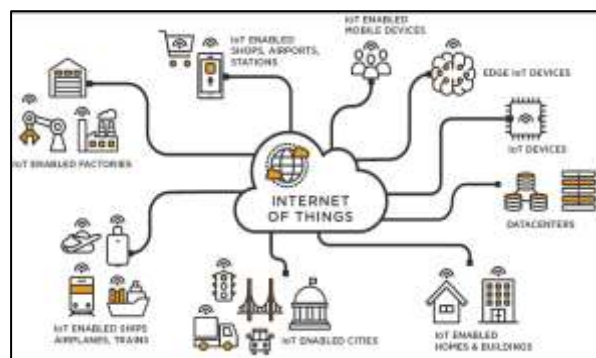
2. INTERNET OF THINGS (IoT)

The Internet of Things, or IoT, primarily refers to the billions of physical devices around the world that are currently

connected to the net, all aggregating and sharing knowledge. The Internet of things

(IoT) explains the network of physical objects or "things" that are embedded with different technologies for the aim of connecting and exchanging information with different devices and systems over the web.

The basic parts of the IoT are devices that gather information. Generally, they are devices that are connected to the internet so that they can have their IP address. To make that information helpful it must be collected, processed, filtered, and analyzed, all contribute to enabling the internet of things Collecting the data is done by receiving it from the other devices to a single assembling point. Moving the data can be done using a range of technologies either wirelessly or on wired networks. The data can be sent over the web to a data center or a cloud that has storage and the transfer of data can be taken place, with intermediary devices collecting all the data before sending it ahead. Processing the data can also take place in various data centers or the cloud.



IoT application promises to bring great value into our lives. The Internet of Things might be a succeeding frontier within the race

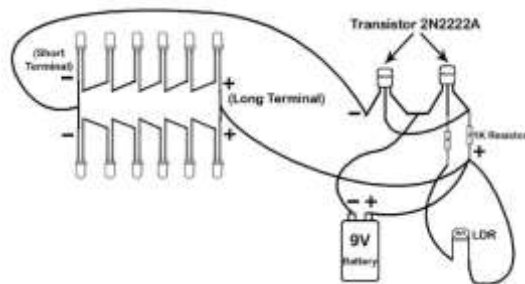
for its share of the wallet. IoT applications are looked forward to providing billions of everyday devices with connectivity and intelligence, thanks to newer WLANs, sensors, and absolute computing capabilities.

3. QR CODE

A QR code (abbreviated from Quick Response code) could also be a kind of matrix barcode (or the two-dimensional barcode) invented in 1994 by the Japanese automotive company Denso Wave. A barcode could even be a machine-readable optical label that contains information about the item to which it's attached. In practice, QR codes often contain data for a locator, identifier, or tracker that points to an online site or application. A QR code uses Quattro standardized encoding modes (numeric, alphanumeric, byte/binary, and kanji) to store data efficiently; extensions can also be used. Since QR codes place information on an object, they're a tool for the IoT.



4. CIRCUIT DIAGRAM



5. COMPONENTS USED

LDR (Light-dependent resistor)

LDR (Light-dependent resistor): A photoresistor or light-dependent resistor is an electronic component that's sensitive to light. When an illuminated object falls upon it, then the resistance changes. Values of the resistance of the LDR may change over many orders of the degree of the value of the resistance falling as the level of light increases. LDRs are made up of semiconductor materials to enable them to possess their light-sensitive properties.



Transistor (2N2222 NPN)

A transistor, also referred to as a BJT (Bipolar Junction Transistor), may be a current-driven semiconductor unit that may be used to control the flow of electrical current during which a little amount of current within the Base lead controls a bigger current between the Collector and Emitter. They will be used to amplify a weak signal, as an oscillator or as a switch. An NPN transistor is driven (or turned on) by a positive current biased at the bottom to regulate the present flow from Collector to Emitter.



1K Ohm Resistor

A resistor lowers the flow of current. The value of the resistance is expressed as a variety of ohms (the symbol Ω is employed for "ohm"). The value of ohms is coded with color and appears as a band on the device itself. Three color bands are used to represent the value because we only encode the primary significant digit, the second significant digit, and therefore the number of zeros. In this lesson, we work this out for a 1k Ω resistor where "k" is that the abbreviation for the prefix "kilo", meaning 1,000. So, a 1k Ω resistor features a value of 1,000 ohms, and therefore the number we'll code is 1,000.



LEDs

In the simplest terms, a light-emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it. Light is produced when the particles that carry the current (known as electrons and holes) combine within the semiconductor material.

Since light is generated within the solid semiconductor material, LEDs are described as solid-state devices. The term solid-state lighting, which also encompasses organic LEDs (OLEDs), distinguishes this lighting technology from other sources that use heated filaments (incandescent and tungsten halogen lamps) or gas discharge (fluorescent lamps).



Battery (9V)

2 Pcs 9 VOLTS Duracell battery with 2 Pc Connector, Carbon Zinc Batteries



6. CONCEPT

The concept used in this project is a very basic logic which starts with having an LDR, Resistor, Transistor and Battery as a major component Which when put in the circuit as the above circuit diagram which works like when the LDR is exposed to light the LDR send some sort of signals which doesn't allow light to glow but then the LDR has no light exposure the LED'S will automatically start because the signal is complete when it is not exposed to the light.

So in this the working will be during the day when the LDR is exposed to light it won't signal the led to lighten up and like this when there is the sun over the top the Street light wouldn't be switched on but if it's a cloudy day, rainy day with lots of dark clouds or night time, then there will be no light exposure to the LDR then it will switch on the lights automatically And if the lights are not working in some area or a certain pole or light is not working, we have numbered the poll accordingly and they will have a QR scanner with the pole which allow people to scan it and give answers to few questions like the pole number, area, and the problem if clearly visible which will directly give complaint to local area administrator and they can fix it quickly so that the problem does not prolong

7. IMPLEMENTATION



8. USES & FUTURE

By using this Automatic system for street light controlling, we can reduce energy consumption because the manually operated street lights are not switched off properly even the sunlight comes and also not switched on earlier before sunset. QR code is a simple way to communicate in our project which basically will allow citizens to directly give feedback or complaint about the streetlights by just scanning and answering the questions. It will be a direct connection between the citizens and the local area administrator.

9. BENEFITS

- User Friendly
- Cost-Effective
- Reduce energy consumption
- Low Maintenance

10. CONCLUSION

This project of a QR-based damaged automatic street light fault detection management system is a cost-effective, practical, and the safest way to save energy. It tackles the problems that the world is facing today, By using a QR code on each pole to scan and submit the issue notification is sent to the authorized Whenever the street light got damaged person the light is damaged, and the location where the light is damaged. It reduces human efforts, delays in fixing the issues.

11. REFERENCES

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