

Intelligent And Weather Adaptive Street Lighting System

INTRODUCTION:

abstract-- This world is full of different kind of light sources some are natural ones while others are man-made light sources. The man-made light sources have only two modes of operation that is switch on and switch off there is no intermediate level that can be set according to the surrounding lighting condition and at the end everything needs to be controlled manually. These lead to wastage of electricity and at the same time a manual control is not effective in the modern era. In this paper, we propose an advanced light control system which is capable of replacing the old generation light control system. a stand alone system through internet of things as a network of communication is implemented. controlling unit coded in python language.

introduction

We are living in the world where everything goes to be automatic from your washing machine to your ceiling fan. The world revolves around the word automation and the ones that are automated are said to be of next generation because they limit the involvement of humans. They are self-sufficient to operate on their own and thereby, saving time and cost by being more efficient than the manual ones. But lighting systems have yet to make its move in these automated crusade. We have just started the crusade in our attempt here.

The present scenario ensures the safety and security has become an inevitably essential. There is a regressive progress in the security system as the influence of modern technology is reaching its peak. When there is a modern Industries with minimum human effort, it's well known as modern

home. Since there is an advent of wireless and digital technologies, all together it introduces a automated intelligent security system. The automated home security system can be designed with the surveillance camera and multiple sensors, and the use of these sensors will be defining the features of these sensors. Faster data transmission is taking place using the Wi-Fi to security systems which helps the user to control and monitor the system globally. The new IoT based products and services will grow exponentially in next few years predicted by the analysts. The IoT involves different link layer technologies and a huge range of devices. IoT provides open access to particular set of data. Is a compact minicomputer which is smart enough to give the good connectivity to the internet as well as boost up the signals. This framework mainly envelopes the home security system from the sensor, networking, integrates real time data and data management. This proposed system has high latency and low cost. The system is highly reliable and consumes very less power in comparison with existing system. The home security system based on some camera connected to the home and the output for this is in real time with the minimum delay in the operation. The objective of this paper is Industrial security using through IoT. The system records the date of entry and exit of staff members in the industrial plants. It will generate alerts if one person is staying in the radiation rooms for more than the particular time limit by checking whether that particular person has left that area or not. It will record the data of the entry/exit using RFID cards The alerts will be given in the form of buzzer alarms and it will display on OLED screen. The admin can see the entire information in the web application

The goal is to reduce the amount of energy consumed and thereby reducing the cost incurred due to energy loss thus proving to be a cost-effective strategy.

LITERATURE SURVEY

Existing Problems:

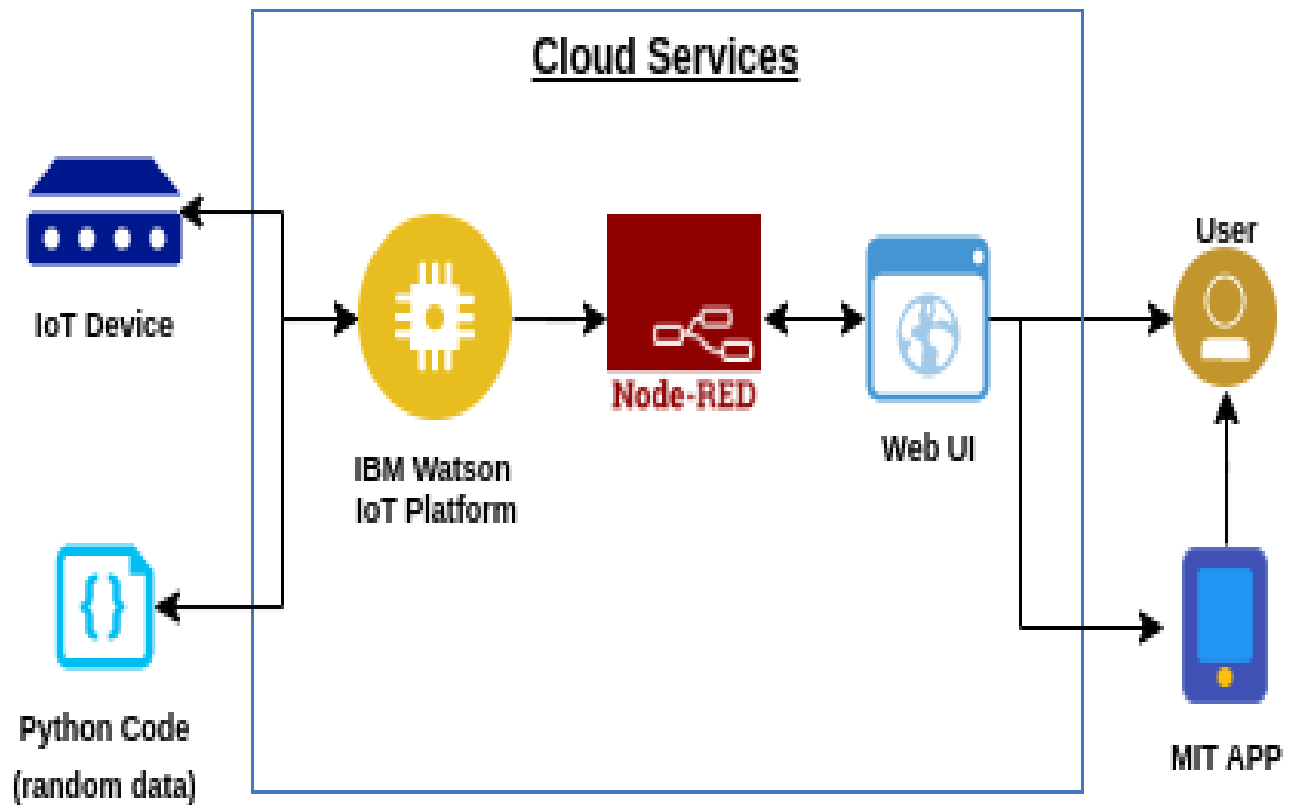
Ancient Lighting system have been confined to two options on and off, due to it had their own share of disadvantage. This kind of operation meant energy loss due to continuous operation at maximum voltage though actual requirement might be less depending upon the outside lighting condition. The simplest solution to it is by calibrating the lights according to the outside lighting condition. This is what we are aiming for in our smart lighting system.

proposed solutions:

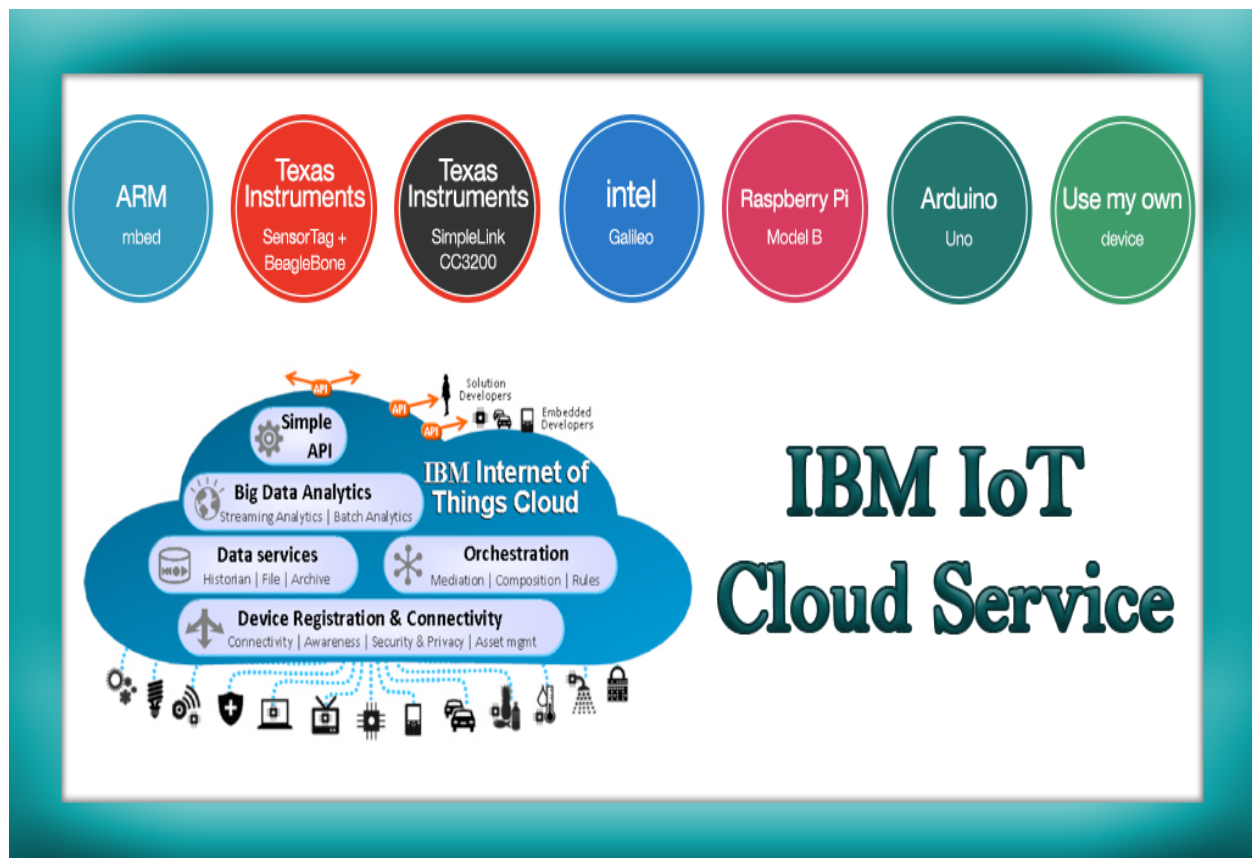
In this paper we are proposing a intelligent street lighting system where the input is taken from the environment. In this paper we are using Python and Internet of Things. In this project we are acessing the random values of sunlight in the environment and the intensity of light. As in every few seconds changing the intensity of light based on varying in brightness of sun light, using ibm cloud and node red connecting it to the ibm cloud giving commands to it randomly from the python code and acessing values. The values are processed in the node red by using delay node setting it for fixed seconds delay acessing the intensity value. By acessing sunlight value sending alert back to the mobile application to change the intensity of light.

Theoretical Analysis

Block diagram:



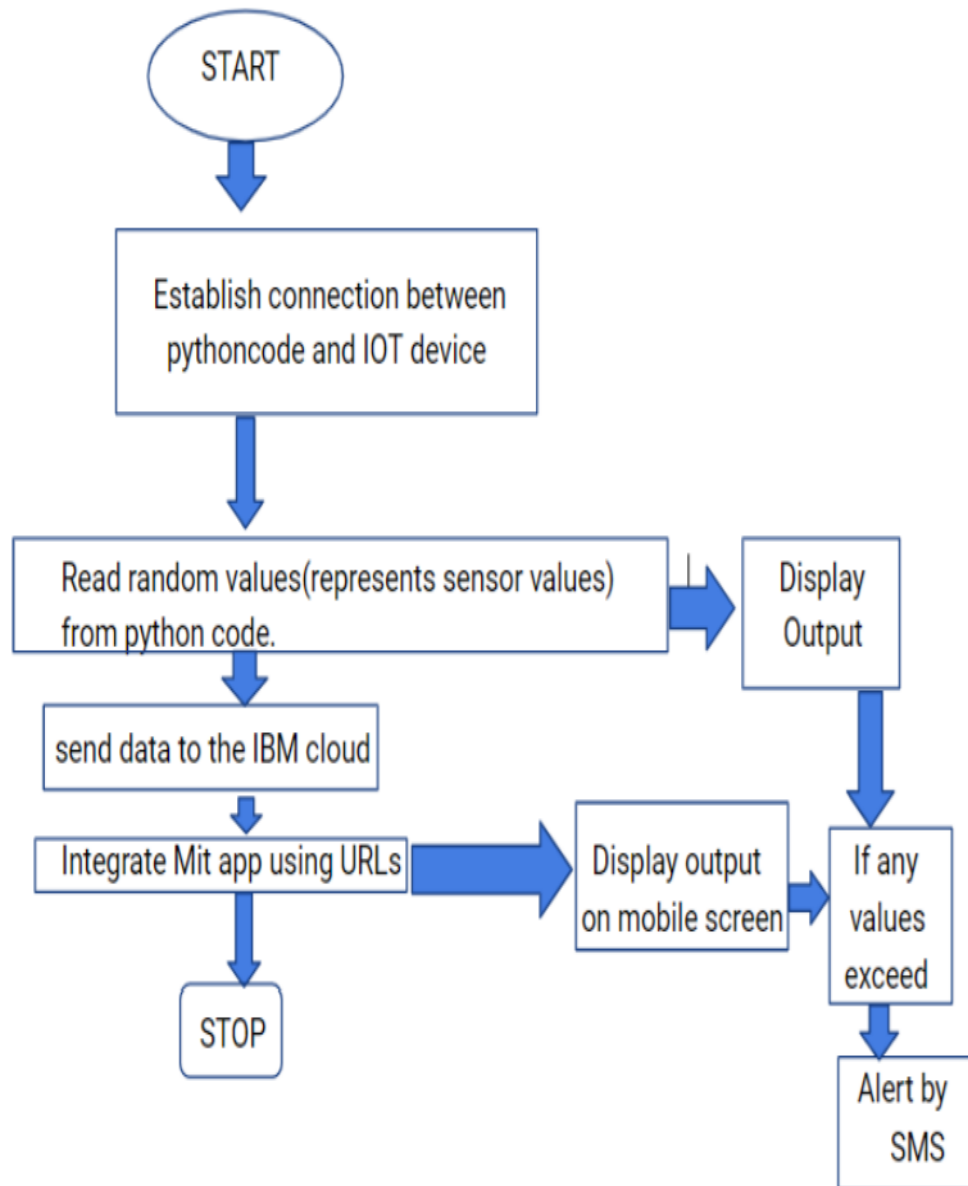
Hardware/Software designing:



Experimental Investigations :

In this paper we are proposing a intelligent street lighting system where the input is taken from the environment. In this paper we are using Python and Internet of Things. In this project we are acessing the random values of sunlight in the environment and the intensity of light. As in every few seconds changing the intensity of light based on varying in brightness of sun light, using ibm cloud and node red connecting it to the ibm cloud giving commands to it randomly from the python code and acessing values.The values are processed in the node red by using delay node setting it for fixed seconds delay acessing the intensity value. By acessing sunlight value sending alert back to the mobile application to change the intensity of light.

Flow chart:



Result

MIT App Inventor x Student Dashboard x SI-2714-1622700515 x (3) WhatsApp x manisha doc pdf (1).p x Service Details - IBM x IBM Watson IoT Platf x +

zxdqt4.internetofthings.ibmcloud.com/dashboard/devices/browse

Apps Gmail YouTube Maps Student Dashboard

Reading list

IBM Watson IoT Platform

sagarvarma.bunny@gmail.com ID: zxdqt4

Browse Action Device Types Interfaces

Add Device +

Browse Devices

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

Device Simulator ☐ ☐ ☐

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
>	<input type="checkbox"/> Sagarjillela	Connected	sagar	Device	23 Jun 2021 04:22	

Items per page 50 | 1-1 of 1 Item

1 of 1 page < 1 >

Cookie Preferences

Type here to search

10:37 24-06-2021

```
*IDLE Shell 3.9.5*
File Edit Shell Debug Options Window Help

ublished data Successfully: %s {'d': {'sunlight': 186}}

ntensity=150

ublished data Successfully: %s {'d': {'sunlight': 12}}

ight is off

ublished data Successfully: %s {'d': {'sunlight': 292}}

ight is off

ublished data Successfully: %s {'d': {'sunlight': 245}}

ight is off

ublished data Successfully: %s {'d': {'sunlight': 268}}

ight is off

ublished data Successfully: %s {'d': {'sunlight': 261}}

ight is off

ublished data Successfully: %s {'d': {'sunlight': 315}}

ntensity=150

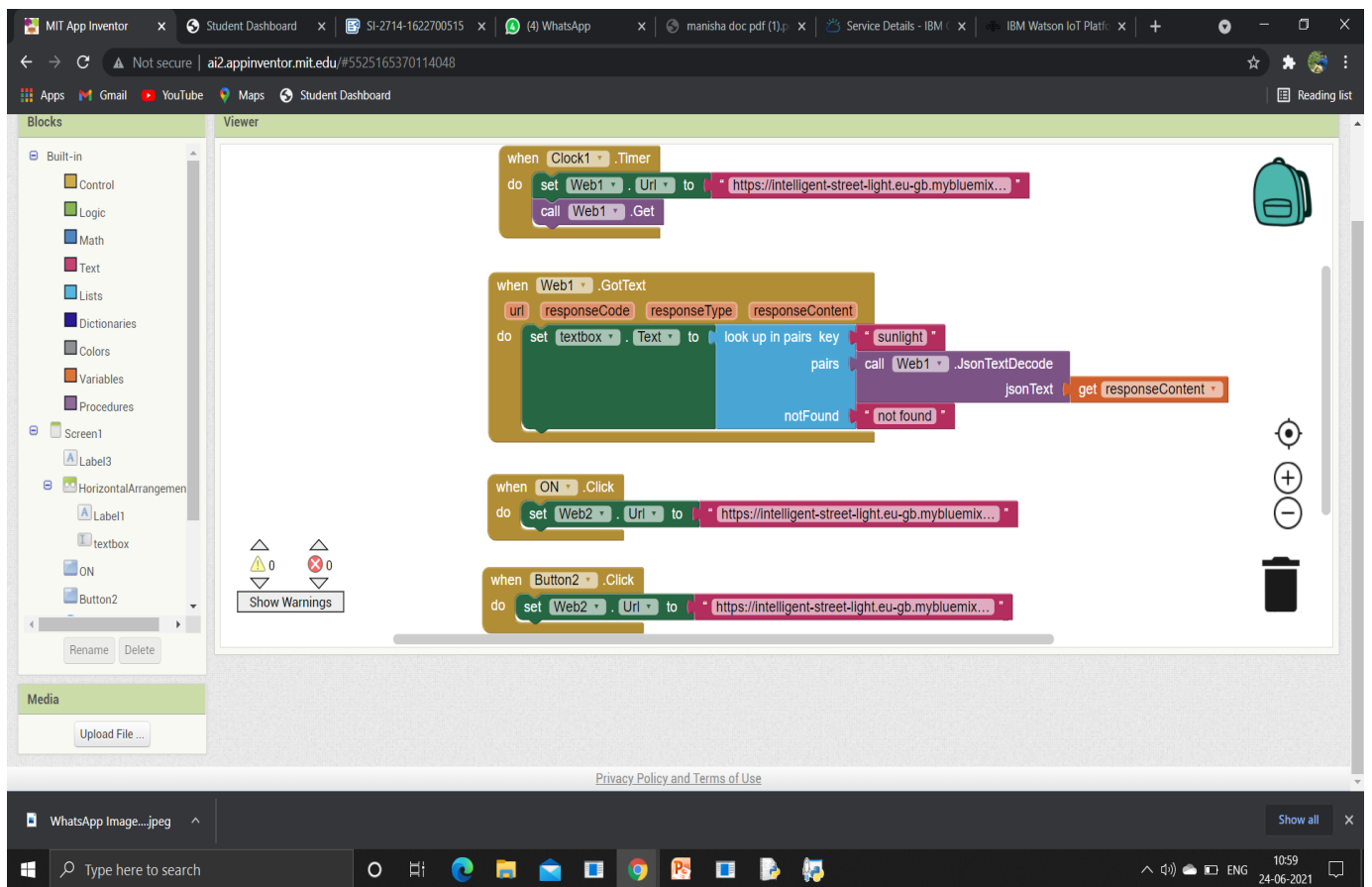
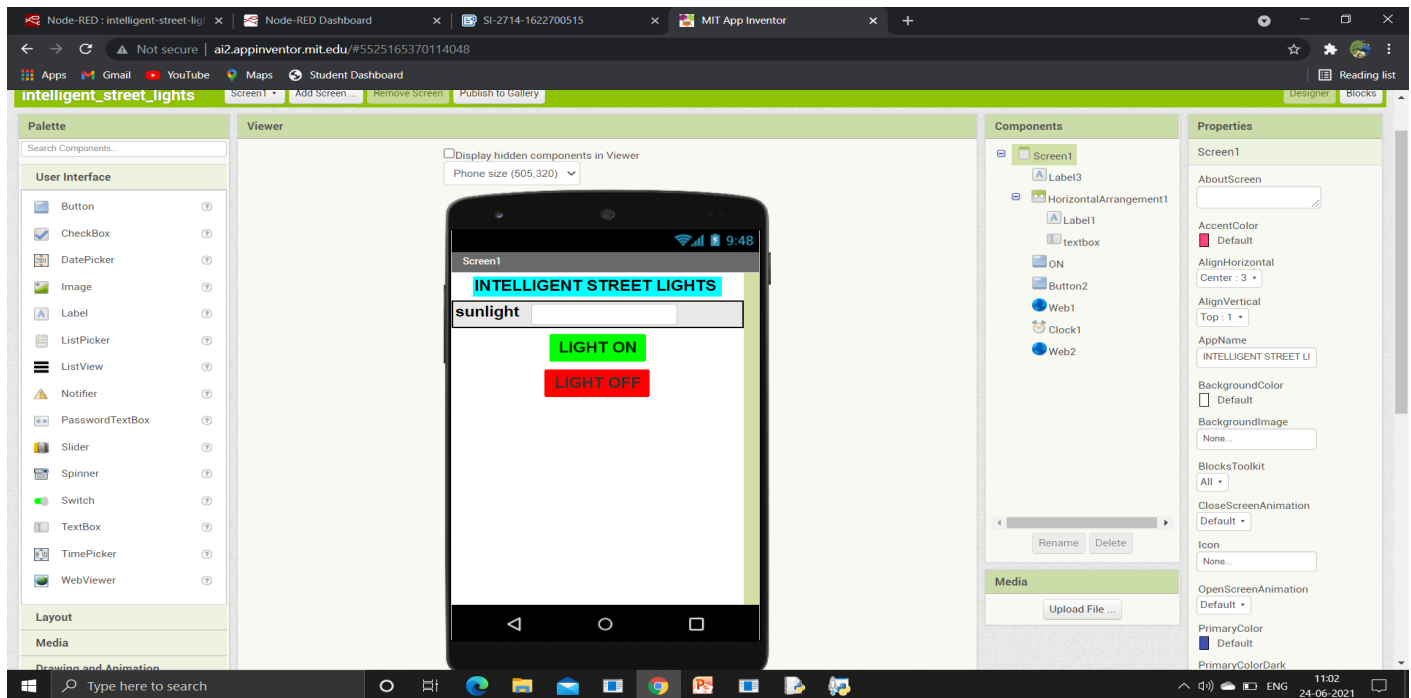
ublished data Successfully: %s {'d': {'sunlight': 9}}

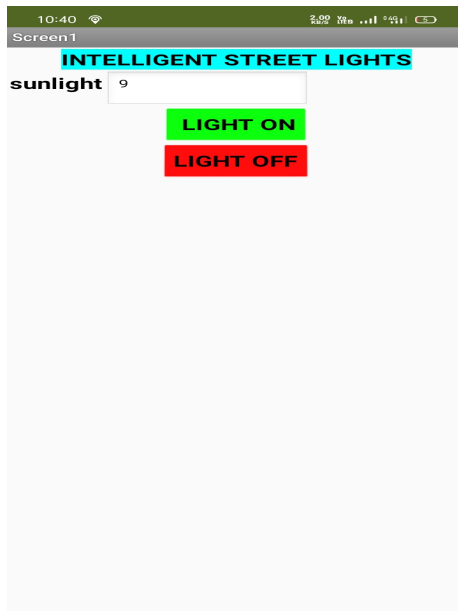
ntensity=150

ublished data Successfully: %s {'d': {'sunlight': 87}}

ntensity=150

ublished data Successfully: %s {'d': {'sunlight': 193}}
```



Advantages and Disadvantages:

As its name suggests, it makes use of street lights very easy. Some of the main advantages of them are given below:

1.No need to control street lights manually:

Street lights are turned on and off automatically. The intensity of light will be changed based on the sunlight. So, the more power is saved by this type of street lights.

2.Electrical power saving:

By decreasing intensity of light in day time where there is no need of bright street light we will 50% power we are wasting now.

3.Increases life time of street lights:

High intensity of street lights leads to damage of lights.by limiting and decreasing the intensity we can increase the life span of street lights.

4.intelligent street lights:

making street lights intelligent smart cities are going to be built.it will save our time,money,and work.

disadvantages:

1. Security and privacy

Keeping the data gathered and transmitted by IoT devices safe is challenging, as they evolve and expand in use. Although cybersecurity is a high priority, IoT devices aren't always included in the strategy. Devices must be protected from physical tampering, internet-based software attacks, network-based attacks and hardware-based attacks.

2. Technical complexity

Though it might seem like IoT devices are performing simple tasks such as counting entry swipes at a secure door, there's a lot of complex technology involved in creating them. Plus, if they're providing essential data to another

workflow or system, they could negatively affect everything connected to it. Miscounting the number of swipes at the door isn't a big deal, but if another device confuses temperature data with entry swipe data, it can be catastrophic. And the error isn't always easy to fix.

3. Connectivity and power dependence

Many devices depend on continuous power or internet connectivity to function properly. When either goes down, so does the device and anything connected to it. Given how intertwined IoT devices are with today's businesses, everything can grind to a halt when they're down.

4. Integration

There's currently no consensus regarding IoT protocols and standards, so devices produced by different manufacturers might not work with existing technology. Each one might require different configurations and hardware connections, making it hard to deploy efficiently.

Applications:

1. Smart Homes
2. Smart City
3. Self-driven Cars
4. IoT Retail Shops
5. Farming
6. Wearables
7. Smart Grids
8. Industrial Internet
9. Telehealth
10. Smart Supply-chain Management

conclusion:

In this paper, we have designed and developed a wireless control of intensity of street lights through Internet of Things module . It is an active system which will control the intensity of street light and turn it ON and OFF based on sun light. It is a friendly user interface system. It is easily installable and can be used anywhere as this is a wireless system. This system is easily operable, low power consumption and low cost. This is developed for remotely controlled and uses the Wi-Fi for transmission of the data's. It is easily installed at any place and can be controlled from any remote area.

Future scope:

Lighting and controlling system of the world has a long way to go. As the technologies improving every second, with time we may have many ways for making our city smart with more light protocol and less delay in the output. With upcoming technologies there will be good enhancement in the computer board as well as the communication protocols, which will make it simpler as well as more light and secure.

Bibiliography:

[1] K. Gill, S. H. Yang, F. Yao, and X. Lu. A zigbee-based home automationsystem.IEEE Transactions on Consumer Electronics,55(2):422–430,May 2009. [2] Y.Upadhyay, A.Borole, and D. Dileepan. Mqtt based secured homeautomation system. In2016 Symposium on Colossal Data Analysis andNetworking (CDAN), pages 1–4, March 2016. [3] N.Singh, Shambhu Shankar Bharti, R. Singh, andDushyant KumarSingh. Remotely controlled home automation system. In2014

Inter-national Conference on Advances in Engineering Technology Research(ICAETR - 2014), pages 1–5, Aug 2014.

Appendix:

source code:

```
import wiotp.sdk.device
```

```
import time
```

```
import random
```

```
myConfig = {
```

```
    "identity": {
```

```
        "orgId": "zxdqt4",
```

```
        "typeId": "sagar",
```

```
        "deviceId": "Sagarjillela"
```

```
    },
```

```
    "auth": {
```

```
        "token": "12345678"
```

```
    }
```

```
}
```

```
def myCommandCallback(cmd):

    print("Message received from IBM IoT Platform: %s" %

cmd.data['command'])

    m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig,
logHandlers=None)

client.connect()

while True:

    sunlight=random.randint(0,400)

    maxintensity=200

    print()

    if(maxintensity<sunlight):

        p=print("light is off")

    elif(maxintensity==sunlight):

        p=print("intensity=100")
```

```
elif(maxintensity>sunlight):  
  
    p=print("intensity=150")  
  
elif(sunlight==0):  
  
    p=print("light is at maxintensity")  
  
myData={'d':{'sunlight':sunlight}}  
  
    client.publishEvent(eventId="status", msgFormat="json", data=myData,  
qos=0, onPublish=None)  
  
print("Published data Successfully: %s", myData)  
  
client.commandCallback = myCommandCallback  
time.sleep(2)  
client.disconnect()
```

UI output:

intelligent street lights

sensor data

LIGHT OFF

LIGHT ON

sunlight

