DEVELOPING SMART CITY THROUGH INTERNET OF THINGS.

Kalyani.S.Agarkar[1],Payal K Alizad[2], Swamini A Chandre[3], Prajakta P Deshmukh[4] , Prof M.D Nirmal[5]

[1] *Department of Computer Engineering*
Pravara Rural Engineering College, Loni.
Loni,Maharashtra ,India

[2] *Department of Computer Engineering*
Pravara Rural Engineering College, Loni.
Loni,Maharashtra ,India

[3] *Department of Computer Engineering*
Pravara Rural Engineering College, Loni.
Loni,Maharashtra ,India

[4] *Department of Computer Engineering*
Pravara Rural Engineering College, Loni.
Loni,Maharashtra ,India

[5] *Department of Computer Engineering*
Pravara Rural Engineering College, Loni.
Loni,Maharashtra ,India

ABSTRACT

It is expected that over year by year the population is increasing and over seventy percent of the world's population i.e over six billion people will migrates to cities and surrounding regions by 2050. So cities need to be smart to satisfy the needs of city inhabitants, encompassing resident, workers and visitors. By using Internet of Things we have an opportunity for the development of smart cities vision that to make the city services and controlling more aware, interactive, and efficient. The purpose of this paper is to control the street light system through Android Mobile. The main aim of street light systems is that lights turn on when needed and light turn off when not needed by the authorize user with the help of wifi module through which he can get access to the street light system remotely. In this paper we specifically focus on the idea to make all the provision which is done manually through the help of software switching the street light, traffic lights and the main power system through the help of server of city software.

Keyword : - *Internet of Things, WiFi module, Arduino board, Android Mobile, smart cities, Relay.*

1. INTRODUCTION

Nowadays, when more than half of the world's population lives in urban areas, when information and communication technologies are real stimulants for modernization in all domains, there are a loT[1] of studies and

debates related to how the cities should transform into "Smart Cities"[2], in order to enhance life quality and to reduce costs, to develop into “Smart City”. The main purpose of this paper is solution of the term "Smart City"[2] and to the strategies required for such a transmutation. The new citizens will have crucial roles in building smart cities; they should be hyper connected, creative, entrepreneurs, also they should actively perform and hook up with the 'cities’ activities. It is within “Information and communications technologies”[3] that smart cities are genuinely turning “smart”[1]. This is facilitated by means of IoT[1]. Street light system plays an very important role in development of cities. So we specifically focus on the street light system for the development of the smart city with the help of Internet of Things[2]. IoT is a computing concept that gives the prospective where every day physical objects will be connected to the Internet and be able to identify themselves to other devices. Each definition shares the idea that the first version of the internet was all about data created & information gathered by people while the next version about the data created by things. Smart city literally means a technological home where we are using the Internet of things through which we are trying to operate the things from the remote location. The purpose of this paper is to make a better use of the public resources and increasing the quality of the service provided to the citizens, while decreasing the operational costs of the public sector.

1.1: IOT:

The Internet of Things (IoT) is an active research area, establishing on connecting real world things over TCP/IP. This trend has recently triggered the research center to accept the interoperability of the Web (HTTP) as an application platform for integrating ‘things’ on the Internet.

1.2: Arduino Board :

It is an open source platform used for building electronics projects. Arduino consist of both a physical programmable circuit board and a small part of a software or IDE that run on your computer used to write and transfer computer code to the physical board. Arduino IDE uses a simplified version of C++, making it easier to grasp the program. Arduino yield a standard form factor that break out the function of the microcontroller into a more accessible package. Arduino board can interact with buttons, LEDs, motors, speaker, GPS units, cameras, the internet, and even your smart phones

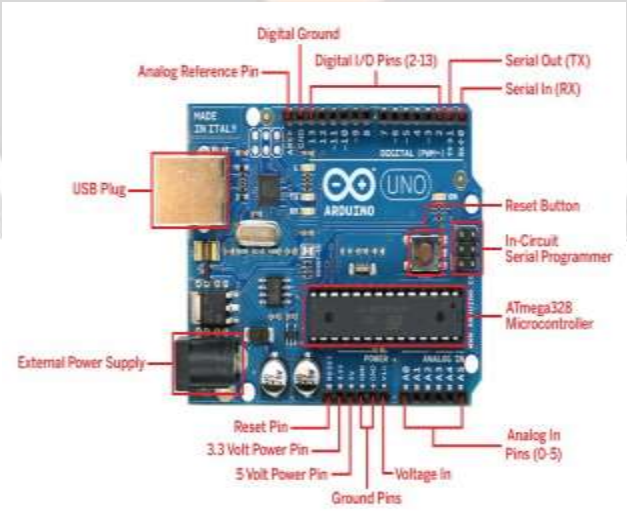

Fig1: Arduino Board

1.3: Relay:

Relay is an electromagnetic device which is used to insulate two circuits electrically and connect them magnetically. They are very convenient devices and allow one circuit to switch another one while they are ultimately separate. A relay switch can be separated into two parts: input and output. The input section has a coil which produce magnetic field when a minuscule voltage from an electronic circuit is applied to it. This voltage is known as the operating voltage. Commonly used relays are available in distinct configuration of running voltages like 6V, 9V, 12V, 24V and many more. The output section consists of connectors which connect or disconnect mechanically.

1.4: Wifi Module:

WiFi is a technology that grant to permit electronic devices to connect join to a wireless LAN (WLAN)network. Access to a WLAN is usually password secured, but may be open, which allows any device in between its range to access the resources to the WLAN network, WiFi technology may be in used to provide internet link to devices that are within the range of a wireless network that is associated to the Internet..

1.5: Android:

Android is a mobile operating system (OS) recently developed by Google, based on the Linux kernel and constructed primarily for touchscreen mobile devices such as smart phones and tablets. It most commonly comes installed on a variation of smart phones and tablets. Android phones are extremely user friendly and as such can be switched to suit your tastes and requirements. You can download applications to do all kind of things like examine your Facebook and Twitter feeds, operate your bank account, order pizza and play games.

2. LITERATURE SYRVEY.

In the early 2000's, Kevin Ashton was laying the preparation for what would become the Internet of Things (IoT) at MIT's AutoID lab. Ashton was cardinal of the pioneers who assume this notion as he searched for ways that Proctor& Gamble could upgrade its business by coupling RFID information to the Internet. The approach was simple but regent. If all objects in daily life were supplied with identifiers and wireless connectivity, these objects could be interface with each other and be managed by computers. We have studied various research papers, journals, articles related to IoT and smart city through which we can get idea or motivation to develop a smart city applications like smart street light system, smart water supply system and many other. SomayyaMadakam. "Internet of Things: Smart Things". Global Journal of upcomming Computer and Communication, Vol. 4, No. 4, August 2015. This paper fair consistently on Internet, Things, and then scrutinize on Internet of Things and lastly Smart Things from researchers', and cooperates perspective. Moreover, this article concentration on the state of Smart Things and its various applications. This in turn would help the new analyst, who want to do research in this IoTdomain.AndreaZanella, Senior Member, IEEE, Nivola Bui, Angelo Castellani, LoreazoVangelista, and Michele Zorzi, fellow, IEEE. "Internet of Things for Smart Cities". IEEE Internet of Things Journal, Vol. 1,No. 1, February 2014. This paper provides a extensive inspection of the permissive technologies, protocols, and designs for an urban IoT.

3. EXISTING SYSTEM.

In today's system the operator has to operate the switch board and manually he has to switch button ON or OFF the street light system. And in a few cities the Street light control today is usually execute through general switch either activated manually on a time based lineup plan or either by a timer setting. Thus it has very limited flexibility and also it does not ensure the security.

4. PROPOSED SYSTEM.

Smart street light control system import a totally distinct perceptive integrating the existing lighting framework. With the help of proposed system an user can operate through Android mobile using IoT from the with the help of WiFi module and Arduino board connected to the Relay through which user can operate the street light system from remote location.

4. MATHMITICAL MODEL

I={I1,I2,…In}

Where I is a set of inputs.

I1= Command request

S={S1,S2,S3,…Sn}

Where S is a set of status

S1=Initialize hardware

S2=Establish communication

S3=Mobile connectivity

S4=Request command

S5=Parse request

S6=Controlling request

O = Is a set of outputs

{O1,O2,O3}

O1 = Control Electronic / Electrical Equipment.

.5. WORKING

In this street light systemwe are using the ardi-uno board, relay, wifi module and Android Mobile through which an operator can dispatch the systemfrom his remote location. An wifi module will have a IP address through which systemwill have a security so that only the authorize user will have control to the street light systemand street light systemwill be become a secure. The user will access the Android app design for the street light systemfrom the android Mobile and further it will pass to the to the wifi module. With the help of wifi module arduino board will recover initialize then connection will get establish between Arduino board and Android Mobile .The wifi module will forward the approach to the ardiuno board and then ardiuno board will get activate and it will pass the signal to the relay and relay will get activated and it will ON or OFF the street lights.

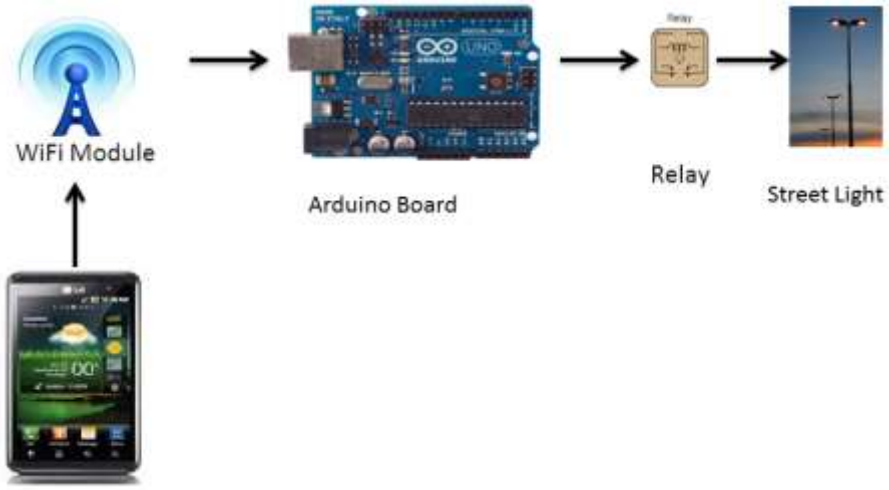

Fig2: Architecture diagram

6. CONCLUSION

The evolution of the upcoming generation will depend on the creativity of the user designing new applications. IoT is an excellent and superb emerging technology to consequence this domain by providing new merging data and the required computational resources for creating factious application for smart city. Street lights are the large consumer of energy in the cities, using up to fifty percent of the cities energy. Thus, if smart street light is designed and installed in the cities, then it will help in operating the street light system through Internet of Things. This system is accomplish,manage, extendable and fully adjustable to user needs.

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