A Smart Way Of Reduce Power Usage Using Iot Gadget

Venkata Ramana N, Ravi Kumar T, Harikalakshmi Sikhakolli, Shaik Aslam

Abstract: ***The Internet of Things is interconnection of vivid systems of different domains which describes the network of home appliances, vehicles, physical devices and all electronic items like sensors, actuators which enables these things to connect, exchange data and communicate through internet. It results in efficiency improvements, reduced human exertions and economic benefits. This paper represents an analysis on smart iot gadget which is built on renowned IOT frameworks. The moto is to save energy using automation which is one of the best solutions proposed for saving the electric current. For smart cities manual operations for street light system is very difficult to operate as there might be human negligence and cost of maintenance is very high. In this project, a sensor is being used to measure intensity of light based on which the light will be turning. If intensity is high, then street-light will in off mode and if low then it'll be in on mode. There are huge advantages associated through the implementation like optimal power consumption, limiting flow of green-house gases, cost reduction.***

Keywords: AT89S52Microcontroller, GSM module, capacitor, Relays.

I. INTRODUCTION

Street light are the lights that illuminate the streets. The primary good thing about the street lightning is safety for each pedestrian and drivers. Well lit road facilitate each pedestrian and drivers navigate simply, alert them to attain obstacles and approaching vehicles. It is the torch bearer to reduce the number of fatal accidents that happens due to lack of enough lighting. So many studies have shown that the accident ratio involving pedestrians is 3 is to 1 that happens in the darkness and daylight respectively. Also crime rate is additionally lower in areas with sensible street lighting, as criminals usually use the quilt of darkness to harass pedestrians. The electrification of local streets is considered as a prime energy expenses for metropolitan cities. A street lightening is an important setup for the security of the citizens as well as the goods. A clever street lightning infrastructure would be efficient and cost effective.

The road light model which is proposed contains a microcontroller helped with different sensors and remote module. The street light controller is productive in controlling LED street lighting relies on movement stream and transfers the data between every light. The data is traded to the base station through new methodologies. This can be exhibited using either manual or auto mode. The object distance with respective to light is the key to the functioning of control frame work. This paper contains 1. Brief Introduction about scheme, 2. Problem definition, 3. Related work, 4. Proposed Scheme,5. Results and analysis of new scheme,6. Conclusion,7. References

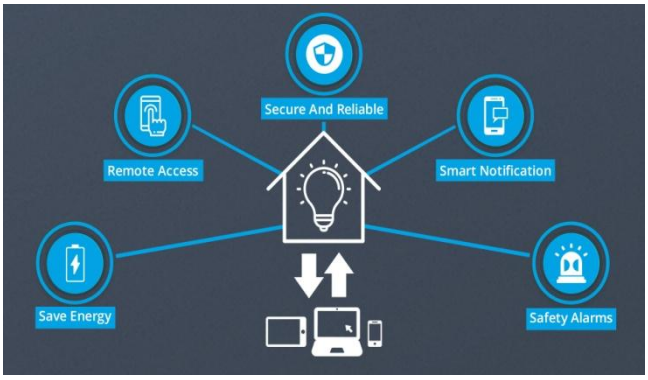

Fig.1 IOT Based Light System

II. PROBLEM DEFINITION

In many towns road lighting fixtures are considered to be a huge parameter for power price billing. As, per present scenario a manual tool is used by which the light can be turned on during the evening time and the other way around amid nightfall. Light will be switched off if enough intensity of light is observed. Lot of energy wastage is observed during mode switching. Lighting will account between 10–38% of the entire energy bill in most of the cities worldwide. Inefficient lighting wastes significant amount of resources and poor lighting may lead to the conditions which are not safe. Energy economical technologies which are latest in arrival and their working style will cut street lighting prices dramatically which may range between 25% and 60%.

III. RELATED WORK

This internal design of dynamic street lighting system is a combination of various components like LDR, AT89S52 micro controller, relay, UART wireless module and GSM. [2] Street light synchronously switches in middle of night and based on the intensity of light observed in day time.

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In this present system the street light will be turned on and off automatically by using microcontroller. The aim is to switch on or off circuits by utilizing GSM. Power utilization is controlled with decreasing and lifts the quality of any enquiry use of LDR sensor. Vehicles are sensed by the usage of IR sensor and relays to update functionality of switches on the street. [5] The microchip acts as a receiver to control computer's interface. In the midst of the night time every light by default is operated in auto mode, but bundle operates on the crux which is misused. Parallel, there is no car improvement on the thoroughfares. The sensors used in the model are of simple accord. They are coined to be dependent resistor sensor. An unconventional switch is being used in the gadget. When the light is considered to be below the minimal requirement for vison. Then light is subsequently switched. LDR has similar functionality as a human eye. [10] Similarly, on the component as in the daylight, it usually diminishes lighting fixtures.

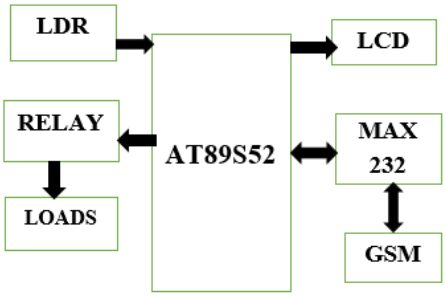

Fig2. ARCHITECTURE

Description Of Architecture

AT89S52 Microcontroller :

This microcontroller has four vivid ports in which each port takes 8 input/output lines. In this microcontroller, most of the ports performs "dual functions". The first port is extensively pinnacle for input/output operations. Another port is used for implementation of counting external pulses, interrupting the program execution. Each port has 8 pins which is invariably an 8-bit variable termed as a 'register'. Further, the AT89S52 is designed to enhance the experience to achieve zero frequency, to choose strength saving modes. Ram timers/counters, serial port and interrupt device keeps function parallel, idle mode stops CPU. Fig1 depicts the AT89S52 microcontroller.

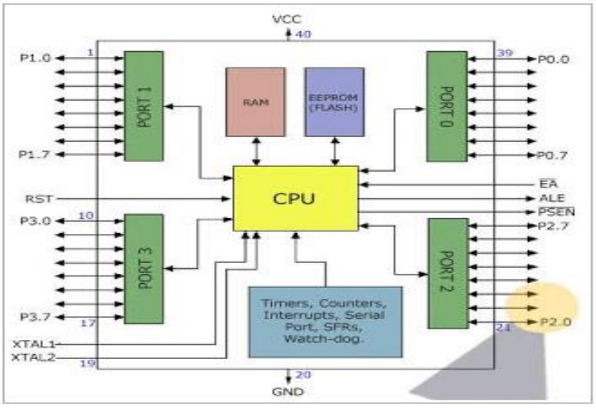

Figure 3: AT89S52 microcontroller

LDR

LDR is made by using semiconductor materials which have effective resistance.LDR is also termed as image conductors and photo cells. It is used in sensing circuits. [3] LDR works with the principle of photo conductivity is stated to be an optical phenomenon where the conductivity of materials diminishes proportionally to the light which is absorbed through the fabric.

Relays

A relay is an electromechanical device which is used only through the AC current flow. [7] Define two circuits; current flown in one circuit invigorates the second circuit working. Despite the fact that transfers are regularly identified with electrical circuit, there are gigantic assortments like pneumatic and water powered. [5] Relays perform 2 important tasks. One them deals with low-slung voltage software, another deals with excessive voltage. For the low-slung voltage programs aim to reduce the sound of circuit.

Capacitor

A capacitor is considered as an aloof terminal electric segment that stores electrical power in electric vicinity. [9] The impact of capacitor is termed as capacitance. On the same time as capacitance exists among any electric powered conducts of a circuit in very well nearness, a capacitor is supposed to give and enhance this impact to the collection of purposeful packages through belief of period, form, and situating of firmly divided transmitters, and the mediating dielectric cloth. A capacitor changed into this way without a doubt first known as an electric powered condenser.

GSM module

The GSM is a device which connects a huge contingent of mobile devices of a specific mobile network in a confined coverage area. [2] The GSM has mainly four frequency bands. Maximum frequency bands of 900MHz and 1800MHzFew highly developed countries like the United States utilize these kinds of frequencies which are allotted to them.

The below table describes (Full Form) the abbreviations used in this paper.

Symbol	Description
LDR	Light Dependent Resistor
LCD	Liquid Crystal Display
AT89S52	8-bit Microcontroller
GSM	Global System For Mobiles
LSB	Least significant bits
MSB	Most significant bits

Table: 1

IV. PROPOSED SCHEME

The first task will be to manipulate the street lights by recording proper inputs and setting desired goals or outputs for the model. The main purpose is to enhance dynamic road light devices in pursuit of defining a sustainable approach. Model which is proposed below is surely feasible. As, it could fulfil all specific requirements with easy production values. It immediately gives out scope for mass production. As, per fig 4 the components are essential for operating the model as per required proportions. As, far as IoT is primarily established by smart sensible lightening fixture devices for a smart city. The model thieves on using LDR for object identification, which depicts a hindrance. As, per lighting obstacle detection which emits light. LDR repute will get switched on automatically after properly checking and detecting if there was any obstacle on the street.

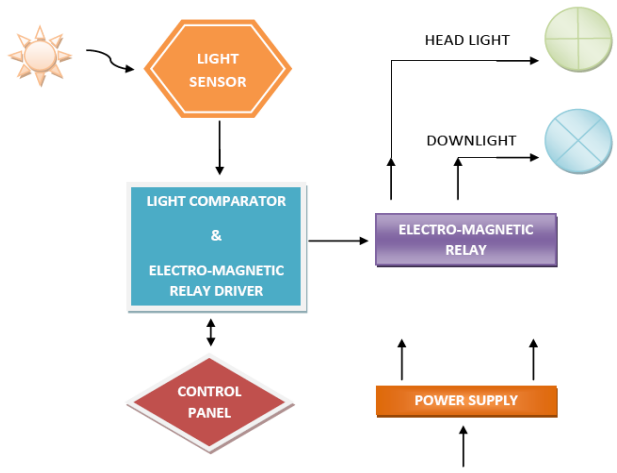

Fig.4 FLOW DIAGRAM FOR DYNAMIC STREET LIGHT SYSTEM

Algorithm

STEP1. LCD COMMAND MODE

Function lcd_cmd(Data type parameter)
{
send msb 4 bits
select command register
enable the lcd to execute command
}

STEP2. LCD INITIALISING MODE
Function lcd_init(void)
{
initialize the lcd in 4-bit mode
initialize the lcd in 8-bit mode
cursor blinking
move the cursor to right side
clear the lcd

}

STEP3. LCD DATA MODE
void lcd_data (unsigned char value)
{
send msb 4 bits
select data register
enable the lcd to execute data
send lsb 4 bits
select data register
enable the lcd to execute data
}

Next step is the representation of the algorithm using the diagram in which all the operations are explained and flow of the procedure is being explained

DIAGRAMATICAL REPRESENTATIONOF ALGORITHM

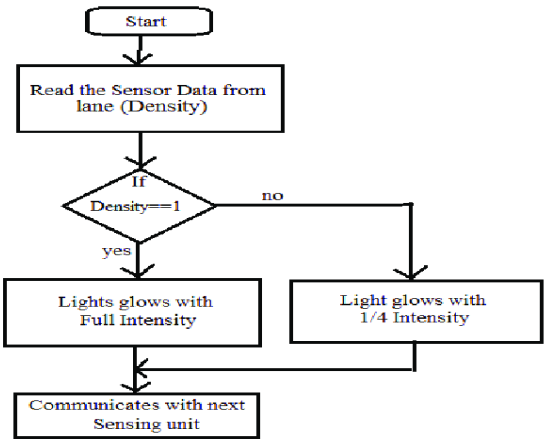

Fig.5.Dynamic street light control system

V. RESULTS AND ANALYSIS OF NEW SCHEME

Emphasis is on the optimal power consumption. [9] The crucible of the paper is to limit the power consumption with proper set of tools. All the components in the model are very simple, cost effective in nature. But, invariably build up a assured intelligent system.

The streets get developed by the utilization of this proposed lighting framework which is sensible, most agreeable and comfortable to keep up and is up to the guidelines of the expanding innovation. The data acquired by this device can be accessed anywhere. With the end goal to improve our everyday existence with IoT, the utilization and need of innovative framework is essential to set up a brilliant city.

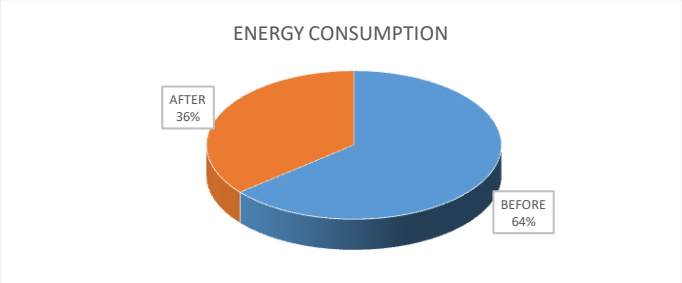

Fig.6 Energy consumption before and after the usage of dynamic street lights.

The proposed model of dynamic street light control and management system provides efficiency as we use the model for long time. As time passes the efficiency will gradually increase and the cost for the electricity will be reduced. Consumption of electricity will be decreased results in increase in efficiency and reduction in the electricity bill.

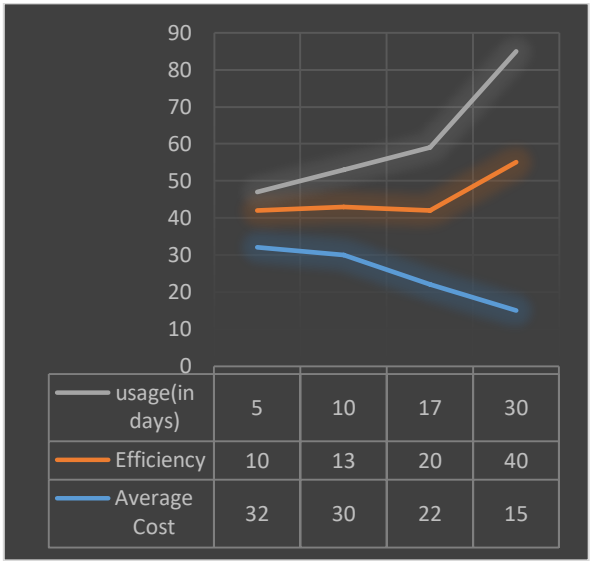

Fig.7 efficiency vs cost vs usage graph of the proposed mode

VI.CONCLUSION

The Streets would be more secure and digitalized by the implementation of proposed model. It is robust, feasible, easy to maintain and engages prominent standards of technology. The information derived can be globally retrieved. The main functionality of this model is to save power and to decrease the use of lamps and by enhancing the standards of society. As the time frame goes by, proper use of the resources will bring down the maintenance cost used in parts of periodic assessment. Integration of new technologies had been implemented in this smart street lighting system which offers ease of maintenance and energy saving. Saving power and moreover diminishing the utilization of lights is a standout amongst the most valuable pieces of this framework. As the age goes, the legitimate utilization of these assets diminishes the cost of support and can be utilized in expressions of periodic. So, we can say that this model is an epitome of saving power and making the use of technology eco-friendly. IOT proposes better technological solutions for the evolution of digital space in the contemporary world. This model is very reliable, feasible and easy to produce in huge proportions.

Table: 2

SNO	AUTHOR	PROPOSED WORK	ADVANTAGES	DISADVANTAGES
1	Ouerhani. N	His model nearly saves 56% of energy which is static and time based street light system	Energy consumption	Very expensive model
2	Anil. A. A.	His model uses relays and LDRs for automatic switching	Decrease in manual power	Maintaining the model will be difficult
3	Saad, M	His model mainly depends upon the photoelectric sensors.	Less consumption of electricity which eventually saves money.	This model of street light is under the control of timer.
4	M. A. Wazed	Light circuit is designed on the basis of intensity of light	Wastage of energy will be reduced and manual work will be decreased	This model consumes huge amount of time
5	Murali Siva	His model uses piezo electric sensors which produces electricity depends upon the amount of pressure	Piezo electric sensors works independently and there is no need of any external sources of electric current.	The piezo can't give computerized HIGH, if any of vehicle stops for longer time.

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