IJCSE International Journal of Computer Sciences and Engineering Open Access
Research Paper Volume-6, Issue-4 E-ISSN: 2347-2693

Automatic Switching of Street Light by Considering Intensity of Sunlight and Fault Detection.

[1*]T.T.Magar, [2]A.R.Babar , [3]S.Ghatshile, [4]P.Jagtap, [5]Deepak Uplaunkar

[1] Computer Department , JSPM Narhe Technical Campus , Pune University, Pune, India
[2] Computer Department , JSPM Narhe Technical Campus , Pune University, Pune, India
[3] Computer Department , JSPM Narhe Technical Campus , Pune University, Pune, India
[4] Computer Department , JSPM Narhe Technical Campus , Pune University, Pune, India

*Corresponding Author: tanujamagar33@gmail.com

Available online at: www.ijcseonline.org

Received: 20/Mar/2018, Revised: 28/Mar/2018, Accepted: 19/Apr/2018, Published: 30/Apr/2018

***Abstract* —** The Internet of Things (IoT) is changing human lives by interfacing general inquiries together. A Street light is a wellspring of light on the edge of a street which turns on around night time for the solace of people. A critical preferred standpoint of street lighting joins: avoidance of setbacks and addition in security. Now– a-days Street light have transformed into a basic edge including road wellbeing. A lot of energy is devoured by street lights. So it is essential to spare the power as much as we can. The cost of energy continues growing as wastage of vitality increases. It has ended up being particularly basic for sparing force. Street light checking control is a computerized system proposed to enhance the effectiveness by means of consequently controlling the exchanging of street light. This errand depicts another new answer for street light control system. It comprises of remote innovation.

***Keywords*—** internet of things, smart city, smart parking system, smart billing,GSM.

I. Introduction

Due to the expansion of common concerns, lighting control systems will expect a basic part in the diminishment of vitality use of the lighting without impeding solace destinations. As indicated the vitality is irrefutably the most basic parameter to consider while assessing the impacts of particular structures on the earth. Imperativeness related releases are responsible for around 80% of air radiations and indispensable to the most authentic overall regular impacts and dangers, including air change, destructive proclamation, dark colored fog and particulates. Lighting is every now and again the greatest electrical load in working environments; however the cost of lighting essentialness usage is low when appeared differently in relation to the work drive costs. In like manner its essentialness saving potential is as often as possible dismissed. As demonstrated by inspect overall cross section based power use for lighting was around 2650 TW in 2005, which was a resemblance 19% of total overall power use. European office structures confer around half of their energy for lighting, while the offer of energy for lighting is around 20-30% in specialist's offices, 15% in preparing plants, 10-15% in schools and 10% in private structures. Insightful lighting control and essentialness organization structure is a perfect response for imperativeness saving, especially visible to everyone lighting organization. It comprehends remote on/off and lessening of lights, which can save essentialness by 40%, save lights upkeep costs significantly, and draw out light life by 25%. The system application in streetlight control for each light will diminish in streetlight power and bolster cost, and addition openness of street light.

This framework will screen the light force and based on checked power of LDR road light consequently on or off. Camera utilized as a part of this arrangement of observation reason to kept the record of passing vehicles from road light. On the off chance that any blame happens in road light at that point by utilizing GSM message send to the road light administration office that the road light winds up defective. Liquor sensor used to recognize the level of liquor taken by driver when vehicle go from the road light liquor sensor consequently distinguish the present time of liquor level. Due to this framework vitality gets spared and additionally mischance may maintain a strategic distance from because of road light blames.

II. Related works

The main aim of the system [1] is to cut down the three important problems that our country is finding difficult to tackle. This system cuts down the cost of conventional system by 50-60% which improves the economy of the country and saves a huge amount of investment as it can be utilized in useful ideas. The system can prevent women harassment, thefts and other threats. It [2] clearly tackles the two problems that world is facing today, saving of energy and also disposal of incandescent lamps, very efficiently. Initial cost and maintenance can be the draw backs of this project.

This paper [3] introduced smart street lights and the prototype implementation by using ZigBee. The utilization of energy hardware [4] is expanding exponentially crosswise over different areas of human life. It joins safe lighting conventions with utilization of insignificant measure of energy. The vitality investment funds, as examined before are exceptional. This [5] completely illuminates two issues which our reality is confronting, reusing of CFL knobs and along these lines sparing significantly more vitality successfully. The LEDs give out eye smoothening brilliance, also it has a long life, and exchanging rate is high and won't let out any unsafe gases to condition. Along these lines for these reasons the foundation displays essentially more positive conditions which can over shadow the present requirements. Streetlights [6] are among a city's vital resources giving safe streets, welcoming open regions, and upgraded security in homes, organizations, and downtown areas. We need to give IP deliver to road lights (IOT) with the goal that the base server can control the entire city's road lights utilizing web. The fundamental rationale behind actualizing this undertaking is to spare vitality.

IoT [8] brings another age for IT advancements with more clever current stage. The composed framework is fit for observing the road lights of an expansive region at a solitary server with the assistance of IoT and further this data can be glided on a site for more effect and information base. The real results of the framework are as per the following All the road light even in the remote territories of Uttarakhand state can be observed through the remote system to be produced, the state of the road light (in the case of working or defective) taxicab be checked without going by the area, scope territory of IoT based framework is worldwide and it can be checked from any remote area. Now– a-days Street light [9] have turned into a fundamental perspective including street security. Road light observing control is a robotized framework intended to enhance the effectiveness via consequently controlling the exchanging of road light. This venture depicts another answer for road light control framework. The road lights are controlled by the base server by simply sending a warning by utilizing remote system. It comprises of a customer server application. The undertaking point [10] is to plan an insightful cutting edge road lighting post that runs an inserted web server to give shrewd electronic administrations to individuals living in the city notwithstanding the vitality proficient lighting administration administrations and other crisis taking care of offices.

III. Proposed Architecture

In proposed system, system will monitor the light intensity and on the basis of monitored intensity of LDR, street light automatically on or off. Camera used in this system of surveillance purpose to kept the record of vehicles passing from street light. If any fault occurs in street light then by using GSM message send to the street light management department that the street light becomes faulty. Alcohol sensor used to detect the level of alcohol taken by driver when vehicle pass from the street light alcohol sensor automatically detect the preentalochol level. Because of this system energy gets saved as well as accident may avoid due to street light faults.

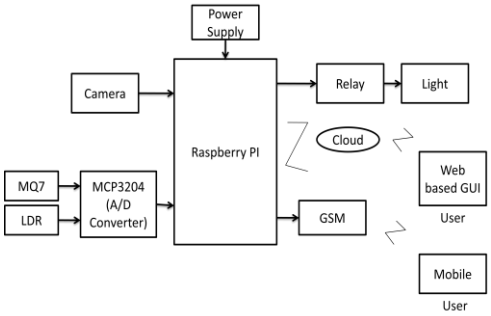


Fig.1. Block Diagram of proposed system

IV. System Algorithm

We propose an algorithm to describe the operation of the system.

Algorithm

Below is the algorithm of the proposed system

Step 1	Start.
Step 2	Initialize the system.
Step 3	Is alcohol detected, if yes then display on GUI.
Step 4	Is LDR value is less than threshold, if yes then ON light.
Step 5	Is light still off after giving command of ON, if no go to step 4.
Step 6	Send msg about fault in light.
Step 7	Display on GUI.
Step 8	Stop.

Flow Chart

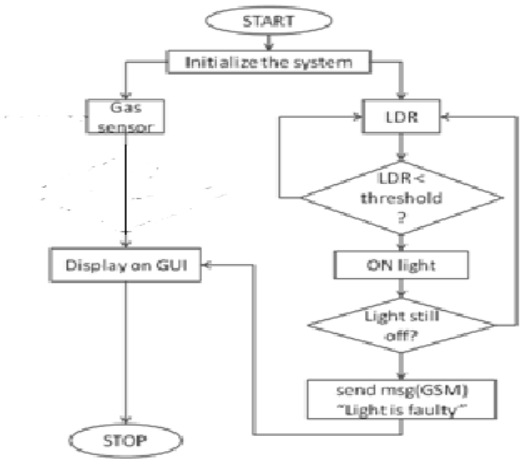


Fig 2 Flow of system operation

If either of the gas sensor or the LDR value goes beyond the optimum value of the system (i.e. predefined threshold) then the system took appropriate action against it. If LDR value is less that means there is dark outside therefore ON Street light and if after making that light ON it is still in off condition, suggest that the light is faulty. Similarly when gas sensor value goes beyond the threshold shows that gas is detected. If anyone of the above mention condition happens then the this information is updated on webpage.

V. RESULT

Hardware Model

Fig 3 Hardware model of the system

Figure 3 shows the actual hardware model of the proposed system which consist of LDR for detecting intensity of light in environment so that the main controller makes right decision about switching ON and turning OFF the light, MQ7 sensor for detecting alcohol in driver's body and camera for surveillance. It also consist of GSM so that if any fault occurs in street light then by the message will be send to the street light management department that the street light becomes faulty.

Web page

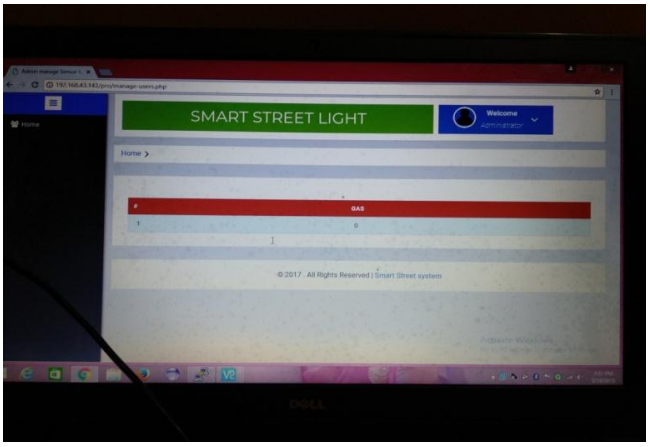
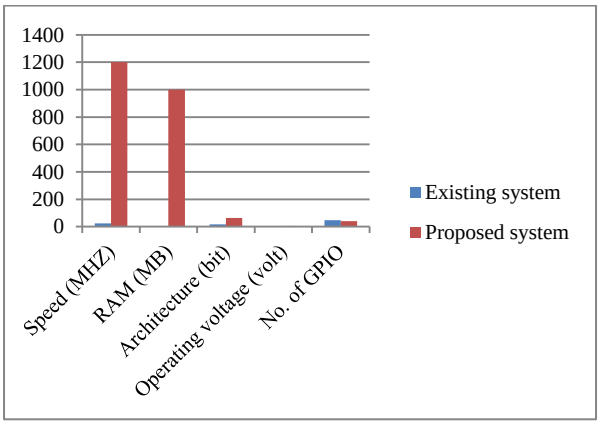


Fig 4: login page and status of Street light.

Fig 4 shows the login page of the smart lighting in street light, where user has to login through his username and password. After login the status of the street light, status of street and amount of CO2 Gas detected is shown.

ANALYSIS: Graph and table

Parameters	Existing system	Proposed system
Speed (MHZ)	25	1200
RAM (MB)	0.01	990
Architecture (bit)	16	64
Operating voltage (volt)	3.6	5
No. of GPIO	48	40



VI. Conclusion

In this paper, we propose the system used to automatically on or off street light. As the LED bulbs are used, it emits less heat when compared with mercury lamps. This system cuts down the cost of conventional system by 50-60% which improves the economy of the country and saves a huge amount of investment as it can be utilized in useful ideas. This system makes the easy way to reduce manual work of on/off street light. System also send the message to street light management department if any fault occur in the street light so it will repair within less time and reduce accident happen due to darkness produced on road way because of faulty street light. Camera used for surveillance kept the record of passing vehicles from street. If any misbehavior happens on street light we get the details of it using camera. Alcohol detection sensor used to detect the level of alcohol detected from vehicle passing Through Street light. This system based on IoT platform so it is easy to see the record taken by camera anywhere anytime within world.

References

[1]. B. Abinaya, S. Gurupriya, M. Pooja, "IOT BASED SMART AND ADAPTIVE LIGHTING IN STREET LIGHTS", IEEE, 2017.

[2]. Parkash, Prabu V, Dandu Rajendra "Internet of Things Based Intelligent Street Lighting System for Smart City" DOI:10.15680/IJIRSET.2016.0505181

[3]. Noriaki Yoshiura "Smart street light system based on IoT" Proceedings of International Conference on Technology and Social Science 2017 KEYNOTE

[4]. J.Arthi, W.Lydiapreethi, B. Gunasundari "IOT BASED SMART LED STREET LIGHTING SYSTEM" © 2017 IJRTI | Volume 2, Issue 4 | ISSN: 2456-3315 IJRTI1704018 International Journal for Research Trends and Innovation (www.ijrti.org)

[5]. Meenu Baby & Aneeshia Johny "INTERNET OF THINGS BASED STREET LIGHTING FOR SMART CITY" International Journal of Latest Trends in Engineering and Technology Special Issue SACAIM 2017, pp. 559-562 e-ISSN:2278-621X.

[6]. Vaishali Gupta, Krutika Thakur, Santosh Surnar, Prof. Ritesh Thakur "IOT Based Smart Street Lights" (IJR) e-ISSN: 2348-6848, p- ISSN: 2348-795X Volume 2, Issue 10, October 2015 Available at http://internationaljournalofresearch.org

[7]. Monika H R, Thanushree B K "INTERNET OF THINGS BASED INTELLIGENT STREET LIGHTING SYSTEM FOR SMART CITY" ©2017 IJEBMS www.ijejournal.org 978-93-84698-33-1

[8]. Anita Gehlot, Rajesh Singh, Raj Gaurav Mishra, Adesh Kumar and Sushabhan Choudhury "IoT and Zigbee based Street Light Monitoring System with LabVIEW" International Journal of Sensor and Its Applications for Control Systems Vol.4, No.2 (2016), pp.1-8 http://dx.doi.org/10.14257/ijsacs.2016.4.2.01 ISSN: 2287-8467 IJSACS

[9]. Snehal Bhosale ,Komal Gaware ,Pradnya Phalke ,Dipali Wadekar, Pallavi Ahire "IOT BASED DYNAMIC CONTROL OF STREET LIGHTS FOR SMART CITY" Volume: 04 Issue: 05 | May -2017 www.irjet.net p-ISSN: 2395-0072 © 2017, IRJET | Impact Factor value: 5.181 | ISO 9001:2008 Certified Journal.

[10]. D. Prabagaran, L.Prakasam "SMART STREET LIGHT SYSTEM BASED ON IOT" (IRJAET) E - ISSN: 2454-4752 P - ISSN: 2454-4744 VOL 3 ISSUE 3 (2017) PAGES 2175 – 2179.

[11]. SayaliArkade, AkshadaMohite, Shraddha Joshi, RutujaSonawane, VikasPatil, "IoT Based Street Lights For Smart City", International Journal for Research in Applied Science & Engineering Technology (IJRASET), www.ijraset.com, IC Value: 13.98, ISSN: 2321-9653, Volume 4 Issue XII, December 2016.

[12]. J.Arthi, W.Lydiapreethi, B. Gunasundari, "IOT BASED SMART LED STREET LIGHTING SYSTEM", International Journal for Research Trends and Innovation (IJRTI1704018) (www.ijrti.org), Volume 2, Issue 4 | ISSN: 2456-3315, 2017.

[13]. ZeeshanKaleem, Ishtiaq Ahmad, Chankil Lee, "Smart and Energy Efficient LED Street Light Control System using ZigBee Network", 12th International Conference on Frontiers of Information Technology, IEEE, 2014.

[14]. ChetnaBadgaiyan, PalakSehgal, "Smart Street Lighting System", International Journal of Science and Research (IJSR), ISSN (Online): 2319-7064, Volume 4 Issue 7, www.ijsr.net, July 2015.

[15]. Shreesh Mishra, Shivakant Gupta, Santosh Singh, TripureshTiwari, Anand Mohan, "ARDUINO BASED LED STREET LIGHT AUTO INTENSITY CONTROL SYSTEM", International Journal of Advanced Research in Engineering Technology & Sciences, ISSN: 2394-2819, Volume 3, Issue-4, April-2016.

[16]. MUSTAFA SAAD, ABDALHALIM FARIJ, AHAMED SALAH and ABDALROOF ABDALJALIL, "Automatic Street Light Control System Using Microcontroller", Mathematical Methods and Optimization Techniques in Engineering, ISBN: 978-960-474-339-1.

[17]. Parkash, Prabu V, DanduRajendra, "Internet of Things Based Intelligent StreetmLighting System for Smart City", International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 Certified Organization), Vol. 5, Issue 5, May 2016.

[18]. Archana. G, Aishwarya N, Anitha J "Intelligent Street Light System" International Journal of Recent Advances in Engineering & Technology, Vol-3, Issue-4, 2015.

[19]. AkshayBalachandran, Murali Siva, V. Parthasarathi, Surya and Shriram K. Vasudevan "An Innovation in the Field of Street Lighting System with Cost and Energy Efficiency"Indian Journal of Science and Technology,Vol-8, August 2015.

