IOT Based Smart Village

Prof. Vijaykumar[1] Madhuri Kharde[2] Komal Kurhe[3] Nilam Landge[4] Vaishnavi Karpe[5]
[1,2,3,4,5]Department of Electrical Engineering
[1,2,3,4,5]Amrutvahini Collage of Engineering, Sangamner, India

Abstract— As we know villages are biggest and most important part in indian population and economy, but unfortunately most of them are underdeveloped prime reasons being poverty, lack of education, poor management of resources and many others. In this paper we are suggesting a IOT technology based approach that can help those villages to rise their quality of life by providing solutions to key problems in rural area Electricity and garbage collection being some of the important issues in village areas therefore our approach suggest sensor based street light systems controlled by ZigBee along with smart trash collection systems to make villages smart and efficient.

Keywords: Smart Village, Electricity Saving, Garbage Collec- Tion, IOT

I. INTRODUCTION

In every village there are some common issues, in this paper we are going to give our approach over those issues.

As we know coal and natural gases are about 60 percent of overall energy source of india, which are renewable and produce lot of smoke and gases while producing electricity, therefore is our duty to properly and efficiently use electric- ity.In many rural and suburban areas most of the street lights are connected to mains directly just for convenience due to that day waste huge energy at daytime, overcome this issue while preserving the convenience we had implemented photo diode based switching which will turn on lights when it's off after sunrise.

Like electricity water is very valuable asset for human life but just because improper management and negligence thousands of liter water get wasted daily. To address this issue we have suggested a system consist of switching relays and alarms which can alert the owner after tank is full and can also switch off the motor if used day by day tons of garbage is dumped in garbage can but due to miss coordination sometimes some bins gets overloaded and after some days lots of garbage collects outside the bins which causes bad odors and many health issue, therefore we suggested a system which can send text messages to garbage collection agencies when a bin gets full therefore they can prioritise the area.

These and many more technological improvements can help an area to higher its living standard, use resources more efficiently and maintain cleanliness making the area true smart village.

II. LITERATURE SURVEY

In the research done by Richu Sam Alex and R Narciss Starbell competence of the street lightning system is improved bye ZigBee and sensors. Less energy utilization by the system is done. But the range of communication of the ZigBee is almost 50 meters. hence, ZigBee is not suitable for street lightning system.[1]

In given approach by Gaikwad Prajakta, Jadhav Kalyani and Machale Snehal camera and the load sensor are used, which are placed at the bottom of the trash can and the camera takes the continuous snapshot of bin and the output of camera load sensor is compared with threshold level.[2]

In research paper "Smart Bin Implementation for Smart Cities" used ultrasonic sensor and GSM.The sensor measure the level of garbage when the waste crosses the level,sensor receives the data of the filled level and then it is sent to the authorized person through GSM to take a further action.[3]

In study done by Deepanshu Khandelwal, Bijo M Thomas, Kritika Mehndiratta and Nitin Kumar, April-2015 the light sensor and photo electric sensor are used. This system was designed to detect the vehicles on highways to switch ON and OFF the light to save the energy, but during the night all the lights are on the highways remain ON for, hence waste of power, and there is a lot of power becomes waste when there is no movement of vehicle.[4]

III. METHODOLOGY

Proposed system consists of three independent units. Each unit can be used separately or with other units as well.

A. Smart Lighting System

Smart light system is daylight based light controller, in this system we have used photo diode to measure the ambient light- ing, photo diode will convert the light energy into electrical energy which then fed to internal compactor of MCU.

While in daylight photodiode will provide voltage above certain threshold to MCU which then keep relay into normally open stage, once light start to fade the voltage provided by photo diode will drop below a threshold which will result in triggering the relay into close position.
Circuit diagram of system provided below (fig 1)

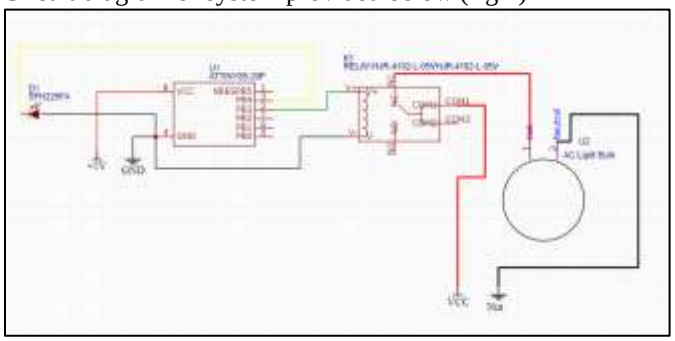

Fig. 1: Block diagram of system

B. Water Tank Alarm

Water tank alarm is a system which can either turn of the motor or play a buzzer when water tank is full to stop unnecessary wastage of water.

This system consist of a buzzer a MCU and a ultrasonic sensor to know water level. When the water rises above certain level the ultrasonic sensor will send a high

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signal to the MCU which then will trigger either a relay to turn off the motor or a buzzer to alert the user if water supply if from gram panchayat.

This can help to reduce the wastage of thousands of liter water daily. System circuit explained in figure below (fig-2)

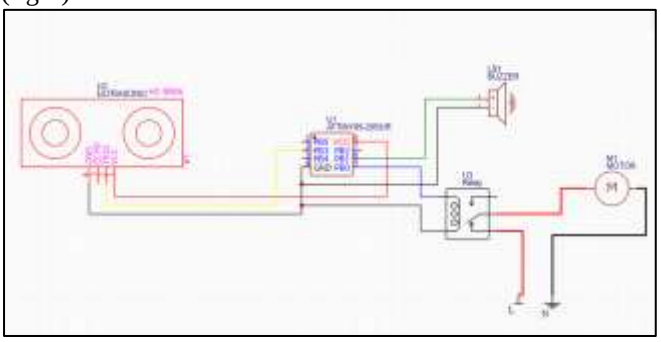

Fig. 2: Water tank system

C. *Smart Garbage Collection*

Smart garbage system is a IOT system which will alert garbage collection agency once a garbage bin reaches certain amount.

In this system we had used ultrasonic sensor to detect the level of garbage in a bin coupled with a gas sensor to detect potential pungent gases if released, This data is then served to a pic microcontroller which will send sms to garbage collection agency using sim800L gsm module (fig 3)

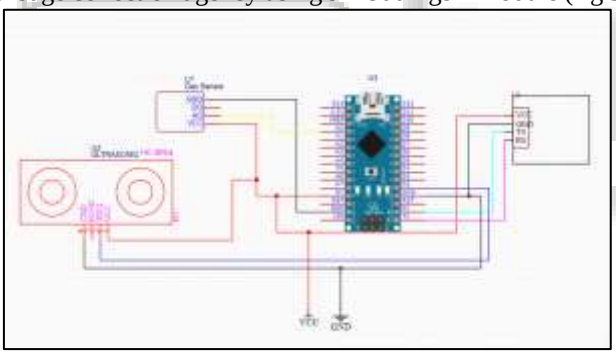

Fig. 3: smart garbage system

IV. RESULT

In this system we implemented the smart village concept using three diffident systems which can be used accordingly Using Those systems we can effectively manage our re-sources and save the environment as well as save some money.demonstration of this system was done on basic prufboard circuit in which system performed extremely well,we are looking froward to implement this in actual village for further testing (fig 4)

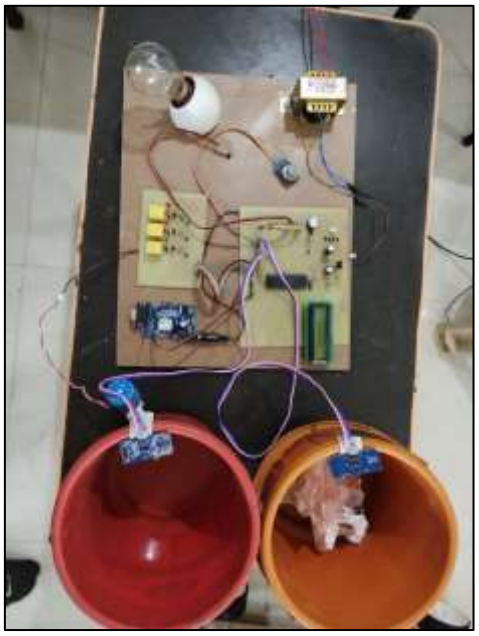

Fig. 4: system working

V. CONCLUSION

The idea of smart villages was consider to as a very advanced and complex thing but now it has a reality. The whole credit of the progress is due to the evolving technology that has been put into the field.

IOT combines the benefits of multiple tech-neologies that are into picture and the gives the output of intelligent and smart devices in the city.

The at most of use such kind of technologies are observed in villages, where they tend to do invest a lot of hard work and time which could even be done in their absence by the smart technologies that are been into ground. we have also done research in many other areas related to Internet of Things and have given suggestions accordingly.

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