International Engineering Journal For Research & Development
Vol.5
Issue 5
E-ISSN NO:-2349-0721
Impact factor : 6.549

SURVEY PAPER ON ENERGY SAVING SYSTEM

[1]Shivpujan Yadav, [2]Mrs. Rupali Shekokar
Department of Electronics and Telecommunication Terna Engineering College (Aff. to Mumbai University)
Navi Mumbai, India[1,2]
shivyadav26366@gmail.com[1], rupaliyawale@ternaengg.ac.in[2]

ABSTRACT

Common problem of energy wastage in educational campuses is mainly due to lights and fans are on without any person inside the classroom. This condition occur because student leave the classroom without switching off the lights and fans. So, we can say that energy is wasted because it is handled manually. In this paper we are using campus card with microcontroller to overcome this problem. Campus card is basically a identity card of students and teachers. Campus card is very easy to use because it is available with teachers and students in campus. And we can place sensors at fans and lights. Campus card is basically a RFID. It will give the location of students and teachers in the classroom. And the sensors which are placed on the lights and fans will sense the information from RFID and this information is given to the microcontroller. When any student or teacher will enter in the classroom with the campus card. And if they are authorized to that classroom then only electrical appliances will be activated. Now the microcontroller will check the predefined value with the current value of sensors. If it is suitable then only lights and fans will be on.

Keywords – Campus card, Campus card reader, PIR Sensor, RFID

INTRODUCTION

The wastage of energy is mainly in schools and colleges. Because if student forget to switch off the lights and fans. Then peon will come at the closing time and then he will switch off lights and fans. These wastage of power of one classroom is very small. But in campuses there are many classroom. We can see there is a huge wastage of the energy in the campuses. We will allocate campus card to every student and teacher in the campus. Campus card will have a unique code. This unique code will be unique identification of every person in the campus. We will place a card reader in the classroom. When any person will enter into the classroom then they will have to insert their campus card into the card reader. The card reader will read the unique number from the campus card. By this it will check whether that person is valid or invalid

Depending on the situation the card reader will display 'invalid" or "valid' on the LCD display. If it shows invalid then card reader will give one chance and display will show us "insert again". Thus with the help of card reader we are also reading the number of every person moving in the classroom. With the help of counter the number will be increasing when student are moving inside the classroom. This card reader can be used as attendance for students. And when student leave the classroom then automatically count will be decreasing. Hence with the card reader we can know the number of person present inside the classroom. And with sensors we will get the location of the student in the classroom. Depending on the location, only that lights and fans will be on. If all the students

leave the classroom then the counter will have value zero and automatically whole system will be shut down. Thus there is no need to switch off the electrical appliances manually. And we can save the energy.

.

LITERATURE SURVEY

In this literature survey section we have discussed five paper. They are given below as follows:

[4] First paper is "Microcontroller based energy saving system". It uses technique that control the switch of the lamp and speed of the fan. When infrared light radiates from the object such as human, then PIR sensor senses that infrared light and lamp can be on/off based on the output from PIR sensor. By using LM35 temperature sensor, the speed of the fan can be adjusted according to the change in the room temperature. Thus PIR sensor is used to control switch of lamp depending on presence of human inside the room. And LM35 sensor is used to control speed of fan. Both sensor are described below

PIR sensor: It is used to sense motion of human. PIR sensor is a pyroelectric device that detects motion by measuring changes in the infrared levels emitted by surrounding objects **Temperature sensor:** LM35 series are precision integrated circuit temperature sensors, whose output voltage is linearly proportional to the temperature. So we can measure room temperature by LM35 temperature sensor.

[1] Second paper is "Automatic classroom lighting controller". In this technique, the main component of the system is campus card. Campus card is easily available in school and colleges. Every student will have campus card. These campus card will work as unique code for every student in school and college. In these technique system works for only one classroom. When any student enter in the classroom with campus card. Then their campus card will be detected, and then lights and fans will be on in that classroom.

[3] Third paper is "An intelligent system for power saving application". In this paper they have use technique for the movement of visitors on the street. The visitor may be vehicle or any person on the street. These method is advanced and complex method for the street light. There will be a sensor placed on every street lights on the street. Sensor will detect the motion of the vehicle or person. Initially all the street light will be off. When sensor of one street lights detects the motion of visitor. Then only that light will be on, and other street lights will be off. When object move beyond the range of sensor of that street light then it will be also off. This system is very costly but it have high efficiency to save energy.

[5] Fourth paper is "Microcontroller based street light energy saving system". In this paper automatically street light will be on and off. This system is basic and simple for the street light. There are two sensors used in this technique. First one is LDR, it will give the intensity of light on the street to the system. Depending on the intensity of light, street light will be on or off. And other sensor is PIR, it is used to detect the movement of person or vehicle on the street. This System will work depending on the output from the two sensor. The street lights will be automatically on in the evening. And they will be off in the early morning.

[2] Fifth paper is "Microcontroller based energy saving module'. In this paper bidirectional counter is used which give the idea about the total person present inside the room. In this method there is bidirectional counter placed at

the door of classroom. When any student go into the classroom, then that counter will be increased by one and lights and fans will be switch on in the classroom. Similarly, when any student move outside the classroom then counter will be decreased by one. When all the student move outside the classroom, then counter will have value zero. And all the lights and fans will be automatically switch off in the classroom. Hence if student is present inside the classroom then lights and fans will be on. If students leave the classroom then automatically lights and fans will be off.

PROPOSED SYSTEM

Thus from above paper we have combine all papers and form a table. It is shown below in figure 1.

PAPER	TECHNIQUE	ADVANTAG E	DISADVAN TAGE	COS T
1	Light will be on, when it detects any person. .And fan speed will be controlled depending on temperature	It is very simple technique	We cannot save more energy	Very low
2	Campus card is given to every student. Lights and fans will be on when card is detected	Lights and fans will be used by only authorized person	Campus card will become compulsory	Mode rate
3	Street light will be on only when any person is detected on street	It have high efficiency to save energy	It is very complex technique	High
4	Street light will be on in evening and will be off in morning	Street light can be controlled automatically	It have less efficiency	Low
5	Bidirectional counter is placed to get the count of student present in the room.	We can use this technique to take attendance	System is complex and it is time consuming	Mode rate

FIG 1: Comparison of five paper

From the above analysis we can design new energy saving technique with combinational and additional feature of above technique and shown below in figure 2.

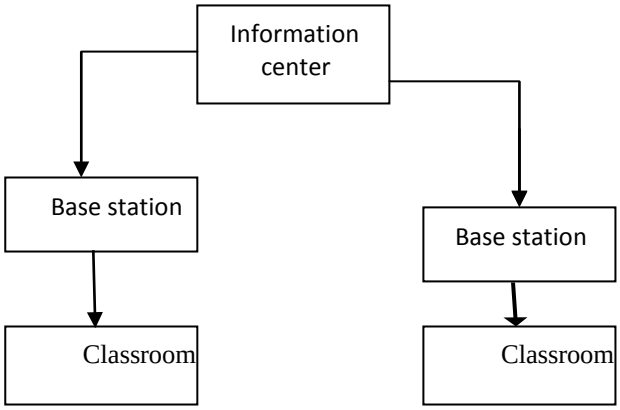

FIG 2: Overview of system

The main component of the system is information center. It is placed in the database of the campus. Information center is connected to the base station. And base station is further connected to the sub control nodes. Information center is responsible for the updating of data form the campus card. Information center pass the information of campus card to each base station. On every floor there is one base station. These base station will control the sub control nodes. In every classroom there will be one sub control nodes. There is one master switch placed in the every sub control nodes. When there is nobody inside the classroom then the master switch will automatically be off. And whole appliances in the classroom will be switched off automatically. Information center communicate by RF communication network with the base station. And with the help of WLAN the base station will communicate with sub control nodes. Thus with the help of the communication between them we can have the effective transmission of the data in the system.

The propose diagram for one classroom is give information on the screen. And lights and fans are controlled with the relay

A. FLOWCHART

When student enter into classroom then they will insert campus card into the card reader, Card reader will check the authentication of the student. If campus card is valid, then power switch of classroom will be on. If it is invalid, then power switch of classroom will be off. When student remove campus card from card reader. Then voice will be prompting for other students to insert the campus card into the card reader. Lights and fans will be on, only if the sensor give the above threshold values to the control node. If all student will go outside the classroom then automatically power switch of classroom will be off. It is shown below in figure 4

B. BLOCK DIAGRAM

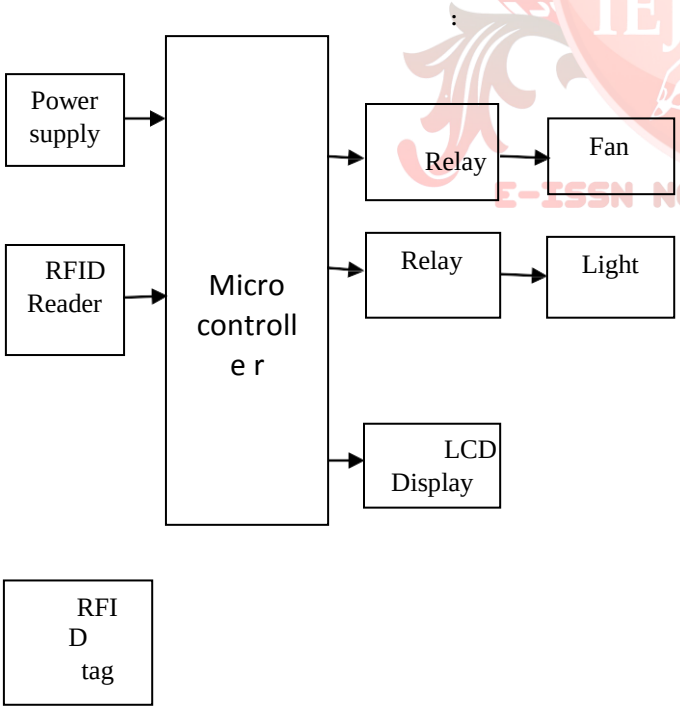

FIG 3: Block Diagram

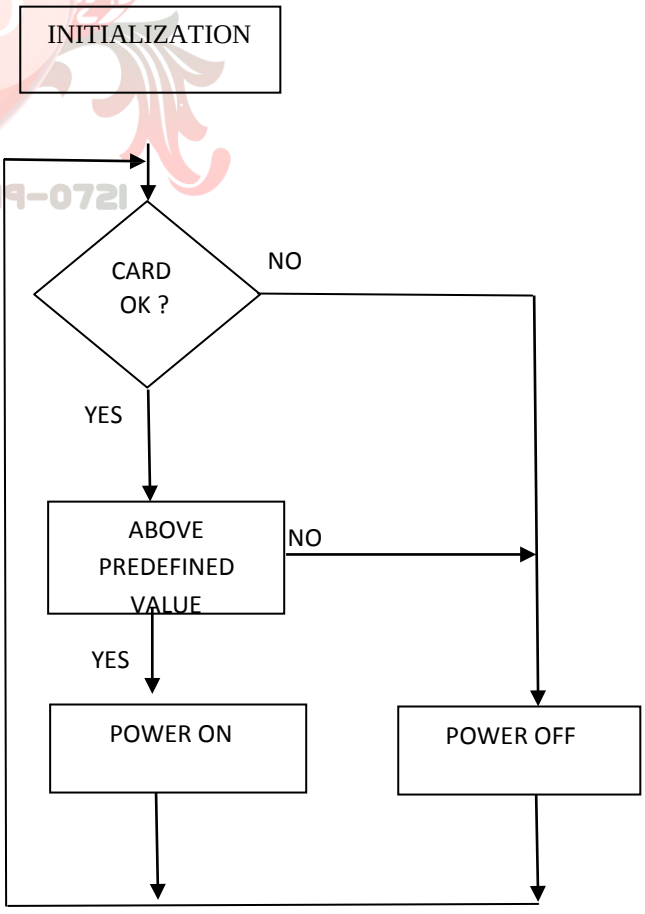

FIG 4: Flowchart

It consists of power supply, RFID reader, RFID tag, relay, microcontroller, light, fan and LCD display shown in figure 3. RFID tag is present in the campus card. And RFID reader is attached to the microcontroller. When any person come inside the classroom then RFID tag will send data to the RFID reader. And this RFID reader will give information to the microcontroller. And by the detection of the card, system will be activated in the classroom. And on LCD display we get the information on the screen. And lights and fans are controlled with the relay

CONCLUSION

We have seen five technique of energy saving, and their advantage and disadvantage. From above technique seen in the paper we can further implement new technique to save energy in campus with a propose technique. With allocating the sensor nodes to lights and fans we can get the accurate position of the student in the classroom. And with the card reader we can verify whether the students is a valid or invalid student for that classroom. Hence lights and fans will be on or off depending on the validity of person. And lights and fans will be on in only that area where student are sitting in the classroom. There will be temperature sensor which will give the information about temperature in the classroom. Depending on that data fan speed will be controlled. Microcontroller will be given a fixed value of intensity of light through programming. If intensity of light in classroom is below the fixed value. Then only light will be on in the classroom. Thus we can save the energy in campus with low cost project and with high accuracy.

REFERENCES

[1] Ansiya Jabeen, D. Mahesh, "Automatic classroom lighting controller and energy saving based on microcontroller unit". International Advanced Research Journal in Science, Engineering and Technology, July 2016, ISSN (online) 2393- 8021 Sonali Gopal Umbre, Komal Dipak Yadav, Priya Laxman Phad, Namrata Shivsharan, "Microcontroller based energy saving module", International Journal For Technological Research In Engineering Volume 3, Issue 6, February-2016, ISSN (online) 2347-4718.

[2] A.Somasekhar, B.Umakanth, "An intelligent lightening system for power saving applications", International Journal of Engineering Trends and Technology (IJETT) – Volume 13 Number 1 – July 2014, ISSN (online) 2231-5381.

[3] M.H. Hussain, H.H. Hok, S.R.A. Rahim, N. Hashim, M. Ibrahim , "Microcontroller based Energy Saving System" . ResearchGate Conference Paper · November 2011.

[4] Nagnath Savant, Prof. A. B. Kanase, Dr. S.P.Patil, "Microcontroller Based Street Light Energy Saving System" IJSART - Volume 2 Issue 5 –MAY 2016, ISSN (online) 2395- 1052.

[5] P. Dilip kumar, B. Kishore, "Campus Energy Saving System with Auto-light Based on Campus Card ". October- 2017.

[6] Bikkumalla Sangeetha, H.Raghupathi,"Performance improvement and energy saving based on classroom based on campus card in embedded systems ". October-2017.

[7] G.Suvarna Lakshmi, "Cost effective energy saving system using rfid ", volume 6, Issue 1, feb 2017.