

RFID BASED HOME SECURITY AND ENERGY EFFICIENT HOME AUTOMATION SYSTEM USING ARDUINO

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Abstract—The project aims to provide an efficient, low-cost automated energy management system for houses. It also provides a facility for surveillance of the house. The system has been built after evaluating the utility features of surveillance and energy management systems available at present and is an attempt to improve these features. In addition to providing a cost-effective solution for energy management in the household, it also provides features to cater to natural disasters like fire. We designed the secure and automatic control service using RFID tagged ID card and context based light and temperature management using sensor and RFID tag. The system is built on an Arduino microcontroller board.

Keywords-RFID, Arduino, Microcontroller

BLOCK DIAGRAM:

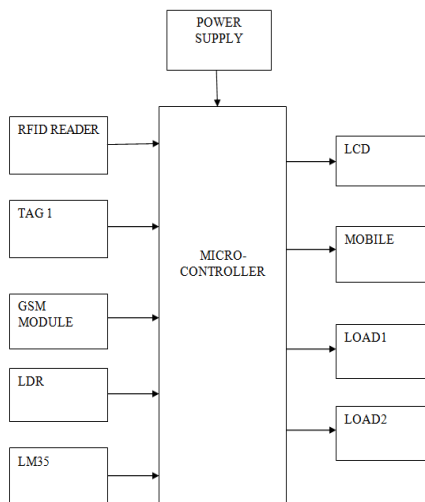


Figure 1.Block Diagram

BLOCK DIAGRAM:

problem and still there are many instances where people are in a hurry and forget to switch OFF the lights and fans. In such situation, a system that saves electricity is of great use. The system incorporates twin features of improving energy

efficiency and providing surveillance at low cost. There are many times when we are in a hurry and wish that all the doors are locked and security is ensured. But to ensure all this together that when people aren't around at home double security along with an energy efficient system can be successfully used.

The employment of mobile handsets as a consumer device to receive warning messages on implies that the user will not need to be compelled to hold an additional piece of equipment because the general public have already got a portable with them most of the time. manually re-check each door will take a lot of time and the same is true for electrical equipment. In such case there is a possibility that the lights or fans might have remained ON which will waste the electricity when not in use.

II.RELATED WORK

Security is of utmost importance to us. A security system if implemented should have the following important ideas in place. Firstly, the system should be made aware of to the perpetrator. The home owner should then be alerted in order that he takes some action. Finally, there ought to be trace using gsm, which could later be will not to assist the police to search out the stolen/misplaced things. The alert mechanism will be incorporated employing a cellular device like a portable. SMS was used to alert the owner. Generally, the setup is created of 3 components: micro-controller, a GSM module and one or additional sensors started in a very remote array counting on the application. RFID authentication system will be employed by authentication through RFID tag. The design consists of Android phone with the home automation application, Arduino. The user can move with the automation phone and send management signal to the Arduino that in turn will manage different embedded devices sensors. A scenario consists of a set of devices during a very specific state and could be activated directly by the user, by time information or by any event among the home.

Light intensity level within the vary of ninety - hundred percent is optimum for traditional sight. If intensity is greater than 90%, no lighting required. Later for every 20% drop in intensity a 10 Watts lamp is turned ON to take care of optimum lighting. Diminish the energy consumption by diminishing the wastage, turning off the lights when not required automatically by observing the light accessibility in a

room. The GSM experiment showed that it takes regarding 8-10s for the safety system to reply the dweller and relevant civil authorities just in case of emergency .

Home security is important for occupants' convenience and protection. At entry purpose the system ought to secured this is often the most purpose to style this technique .This paper aims to develop a affordable suggests that of home securitySystem exploitation detectors likevibration sensor. Knowledge from of these sensors is regularly received and processed by Arduino board that acts as a microcontroller unit. Just in case of untoward things, the Arduino can trigger Associate in Nursing alarm and alert messages are going to be sent to user's mobile via GSM. So the system ensures home safety in addition, as security.

III.PROBLEM STATEMENT

Electricity is central to all the activities of the modern society. In the present day situation, energy catastrophe is a huge challenge; a system that saves electricity is of great use. The existing system did not provide to incorporate the features like improvement of energy efficiency and surveillance at low cost.

IV. PROPOSED METHOD

The proposed method aims at developing an efficient system for the common people like us providing security and energy saving at the same time.While it should seem like there are previously a few opportunities in the field of security and energy management system, but we recognized how often these systems were absurdly expensive either having extreme hook-up fees or forcing the owner into a monthly contract that becomes terribly expensive with time.

HOME SECURITY SYSTEM MODULE

All these systems together perform a double security check to avoid any kind of theft and security related issues.Users will have significantly portable RFID tag that the reader will read the tag.

The person will need to read the tag at RFID reader; it will then read the tag and id information and send it to the microcontroller. Since the tag which is scanned is a registered tag it makes you an authorized entity for the system. In accordance with that, it will stop the buzzer alarm from ringing and be in that state for 5 seconds after that sensor will revert back to its previous state which is an essential part, since we do not want door remains unguarded for a long time even after an authorized attempt.

In this case, if an intruder wants to get inside and scans an unregistered TAG then the system will startthe alarm. It will keep on buzzing till 5secs which give sufficient time for the security to reach the scene and avoid any kind of burglary. We want to devise a system that's each cheap and a onetime investment and feel there's a true marketplace for a solution. The system provides to incorporate the twin features of improving energy efficiency and providing surveillance at low cost.

In case if the impersonator intelligently enough damages the RFID READER system because he can see that even after that he won't be able to trespass without alerting the home owner. This is ensured by the vibration sensor which the person will interrupt resulting in activating the burglary alarm along with initiating the Arduino (multi-controller) to further activate the GSM900a module which will call the owner.

ENERGY EFFICIENT SYSTEM MODULE

The LDR (light dependent resistor) is used in order to Control the number of lights to be switched ON in a room by constantly checking the amount of light. On a normal sunny day, the lights will be OFF even if the temperature sensor marks the presence of people inside the room. But on a cloudy day, once the illumination levels are going to be low, the controller determines the estimated lighting by checking the illumination level and initiates the lights.

Along with this, the temperature sensor keeps a check that unwanted fan or AC doesn't remain ON and if required, they are adjusted according to the temperature of the surroundings and the number of people inside the room. Thus, energy spillage is reduced.

- a) The system will read the RFID TAG.
- b) If the RFID TAG is registered means the person to enter into the home.
- c) The person doesn't have an RFID TAG and tries to get into the house. The vibration sensor will activate the burglar alarm as well as it will give notification to the owner as "unauthorized person" entered into the home.
- d) If the person enters the home means the system will check for the environment temperature & cloudy day. It increments the count value by 1.
- e) If the environment temperature is above the threshold value means fan and AC are automatically ON; Otherwise fan and AC are in OFF condition.
- f) If the person enters the home means the system will also check for the cloudy day.
- g) If the day is cloudy means fan and AC are automatically ON; Otherwise fan and AC are in OFF condition.
- h) If any person leaves the home means the counter value is automatically decremented by 1.
- i) When all people leave from home, the counter value is less than 0, the proposed system will switch OFF all the electricity consuming devices.

FLOWCHART:

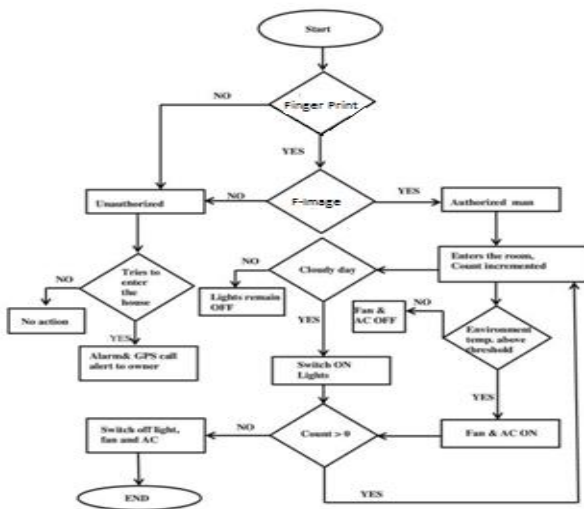


Figure 2.Flow chart

VI. RESULT

The result of home security & energy efficiency system modules are given below. Registering of TAG by the owner using RFID READER sensor is shown in the Fig3.



Figure 3.RFID READER



Figure 4.Enrolling with Sensor

If the house owner wants to take away the TAG id from any of the members staying at his residence, he needs to rescan the TAG followed by RFID TAG is shown, the user registered hence allowed entry. Depending on environmental conditions lights, fans and AC will be switched ON as determined by sensor values.

Adjust the lighting & other electrical equipment when people leave the room Based on Light intensity for electricity saving Unauthorized entry is shown in. The overall working model is shown.



Figure 5.LCD show the Message sent

Existing RFID TAG systems don't seem to be as efficient, however, if these RFID READER systems are clubbed with vibration sensors and GSM900a then the existing system will perform higher. If the person tries to surpass the RFID READER TAG, then the vibration sensors at the doors are activated and therefore the alarm can buzz together with a call to the registered numbers. Shown in the fig5.

Once the RFID TAG is scanned and placed within the slot the security check is passed and electricity is ON. However, the lights, fans, air-conditioner don't have a modulator or sensor installed in room to detect if they're unnecessarily ON which may be avoided by implementing this technique.



Figure 6.Message Format Of The GSM

When all people leave switch OFF all the electricity consuming devices and activate the double security check system if in a sleep state. LCD show the Message sent shown in figure 6.

VII. CONCLUSION

The project can be implemented for a double security check for home when the homeowner has gone out where he will be informed through a call that a burglary has happened at his residence and he should immediately attend to that. It also caters to the need of energy management, which checks the presence of people inside and switches on the lights and fan based upon the weather condition. All this will give a person the freedom to work on more important issues.

VIII. FUTURE WORK

This system can be used for hostels where the corridor and bathroom lights always remain ON. The lights remaining on costs a lot to the University and by the use of this system. The energy saved can be used in places which are deficient in power. In this way, we can contribute a little towards humanity and can take one step forward to save the nature and our planet Earth which has given us everything.

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