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Electronic Eye

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***Abstract*:-**Electronic Eye is a security system that is based on IoT(Internet of Things). It uses sensors to detect the motion and generates an alert call for the owner of the safes or lockers as well as turns on the buzzer indicating theft**.**

Keywords*—*IoT; security system; lockers; safes; theft

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I. INTRODUCTION

The Internet of Things(IoT) has the power to change the today's world, just like the internet did or maybe even more than that. Interestingly, Internet of Things is the combination of electronics and internet.

The Internet of Things (IoT) can be defined in more than one ways. The Internet of Things is a particular type of network which is designed to connect tangible devices of daily life like vehicles, physical devices used in homes and other likely objects which are embedded with sensors, software, some electronic and most importantly has connectivity through which these objects gets connected and thus exchange of data takes place.

IoT is producing a wider scope rapidly as it is related to daily use objects and chores. It makes these objects to send and receive signals through small electronics uses "Internet" as the medium of connectivity. Because of the immense possible aspects of it's usefulness, iot is being discussed every then and now worldwide.

The fact is that IoT allows for virtually endless opportunities and connections to take place, many of which we cannot even think of or fully understand the impact of today. The future scope of Internet of Things is such vast and huge and obviously bigger than one can imagine right now. The Internet of Thing is a system of inter related mechanical and digital machine and computing devices. It works on the technology that allows transfer data over a network without requiring human-to-human or human-to-computer interaction.

This security system is based on the application of Internet of Things which will provide protection against pilfering and thievery of personal belongings. Thefts have been increasing at an alarming rate day by day despite so much security and protection provided to individuals or firms and organizations. This security system provides protection at the ultimate step of the theft or robbery attempted when the intruder has crossed all the security premises as this system is placed inside cash boxes, lockers and safes or inside any other thing like those where security is must and also ultimate requirement.

It is an electronic-eye-controlled system with a PIR (Passive Infra Red) sensor that senses the motion and generates an alert call for the owner of the safe and also turns on the buzzer for indicating thefts.

II. LIST OF COMPONENTS

In our system we have made used of different types of components. They are:

- **Arduino Uno:-** Arduino UNO board is used for Internet of Things applications. It is an open source platform. Mainly it is used for building electronic projects. Arduino consist of both physical programmable circuit board and a piece of software IDE(Integrated Development Environment).
  Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or Breadboards and other circuits [3][4].This board can be powered by usb connection or external supply. The UNO is the most used and documented board of the whole arduino family.

Fig. Arduino UNO

- **Ethernet Shield:-** It is also used for the applications of Internet of Things. The arduino Ethernet shield connects your arduino to internet in mere minutes.

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Just plug into module on your arduino board. This shield enables your Arduino to send and receive data from anywhere in the world with an internet connection[3][1]

.It is based on wiznet w5500 ethernet chip. This shield allows an arduino board to connect to the internet. It provides a network (IP) stack capable of both TCP and UDP. It supports up to eight simultaneous socket connection.

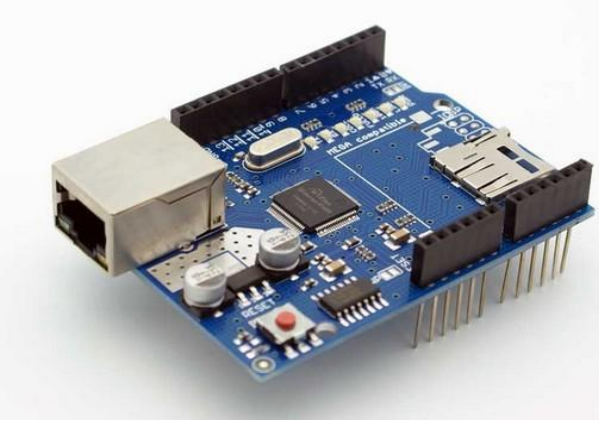

Fig. Ethernet Shield

- **PIR Sensor:-** PIR stands for Passive Infrared. A PIR based motion detector is used to sense movement of people, animals, or other objects. This sensor is also known as PID for passive infrared detector. A passive infrared sensor (PIR sensor) is an electronicsensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. [5][1]. The PIR sensor itself has two slots in it, each slot is made up of a special material that is sensitive to IR.

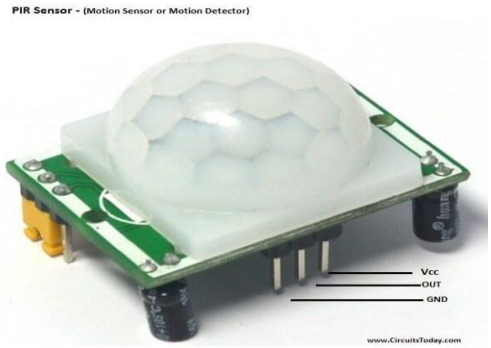

Fig. PIR Sensor

Other hardware that is required to make this system are breadboard which is used for circuit designing, Jumper wires for the connection purpose, Buzzer which is used as alarm, LAN cable for internet connection, Battery is used for the power supply.

III. METHODOLOGY

Each lockers and safes come with numerical locks or lever handle locks. But nowadays it is to open such locks. Therefore Electronic Eye acts as a backup option and the interesting part is that it is placed inside the lockers safes or cashboxes. Any motion detected will generate alert call and triggers the alarm. Moreover this system is based on IoT.

The basic purpose behind this system was to provide protection against theft, property damage as well as personal protection against intruders. Though each lockers, safes come with lock system either using numerical lock or lever handle locks but nowadays it is easy to open such locks. So we have provided a backup option and the system is placed inside the locker so that even after the locker has been opened, it will alert the owner and trigger the alarm.

The main goal of this system is to provide a security which uses an electronic-eye-controlled system with a PIR (Passive InfraRed **)** sensor that senses the motion and generates an alert call for the owner of the safe and also turns on the buzzer indicating thefts .

The system is placed inside the locker or cash box. With any kind of motion happens inside the locker, the PIR sensor senses the motion and rings the buzzer with making the owner informed about the action by an immediate phone call.

But in case of locker being accessed by the owner itself, the owner silence or deactivate the alarm by putting the correct password. Entering a wrong password will continue ringing the alarm and will alert everyone near
The following figure shows the circuit diagram of the system:

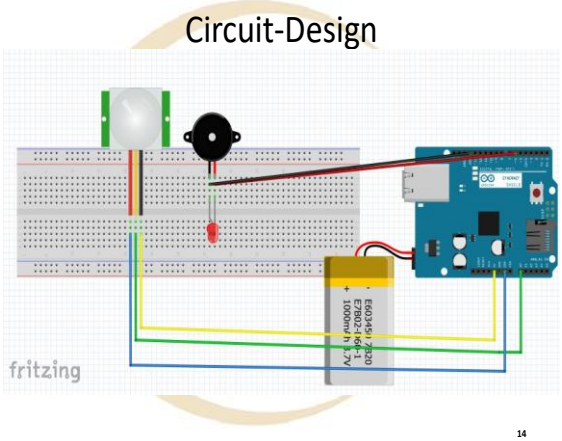

Fig. Circuit Diagram of the system

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Following are few steps required to run the system:

1. Fix the system into the place where security is major concern.
2. Check whether the system is connected to power or not.
3. Connect the system to internet connection via LAN cable.
4. The system is then ready to be used.

The following figure shows the block diagram of the system:

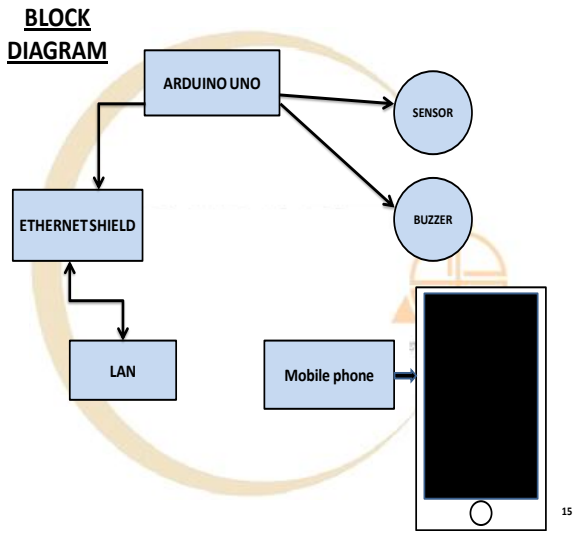

Fig. Block diagram of the system

IV. TESTING

The Ethernet Shield is connected to the arduino which will provide internet connection to it via Lan cable. The PIR sensor is used to detect the motion. The whole system is placed inside the locker or cashbox.

After giving internet connection via Lan cable, the PIR sensor will detect the motion if any intruder tries to access the locker as it will detect the motion of the intruder's hands trying to access the locker. Then the buzzer will automatically start ringing and alert call will go to the owner of the safe saying that you safe has been accessed and will ask for a passcode.

If owner is accessing the locker, then he or she will type the right passcode and the system will get disabled till the time owner has not closed the door of the locker.
After the closing the door, the system is enabled again. But if the intruder is accessing the locker then also the alert call will go and then the owner will come to know that his safe has been accessed. So basically to disable the system, the passcode is featured into the system.

V. CONCLUSION AND SCOPE OF FURTHER WORK

This system can be implemented to secure cash boxes, and lockers in banks, homes, malls etc., wherein the security is a major concern. It is placed inside cash boxes & lockers.
We have also planned to include two features into our system to make it more reliable, efficient and user friendly. These features include Multiuser and Use of biometric applications:

- user:- We are planning to make our project multiuser that is whenever anyone tries to access the locker alert call can go to more than one person at a time. This project is also useful for those who are having a joint account at bank.
- Use of Biometric Applications:- We are also planning to make the use of biometric application.. With the use of it, instead of giving the passcode to switch off the alarm, we can use the face detection so that whenever the owner is accessing the locker, face detection will detect the face of the owner and it will not ring the alarm or give the alert call. We can also make the use of fingerprint scanning or eye scanning.

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