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IOT BASED SECURITY SYSTEM

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ABSTRACT:

In today's rapidly moving world where almost everything is driven by technology, it has become the central and essential part of living. Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the internet. With increasing rate of crime, protecting our loved ones and our belongings has become important. Such situations can be solved by exploiting the latest functionalities that current technology has to offer i.e. IOT which provides seamless data communication; remote control ability makes it easier to automate the process of security. Automation of security can be achieved by designing an application on Raspberry Pi and ATmega 328 microcontroller through various sensors such as motion sensor -PIR (Passive Infrared) sensors for detection of any intruder in the house, upon detection an alarm is raised and the owner of the house and notification messages are provided. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. This project presents the overall design of Home Automation System (HAS) with low cost and wireless system. The smart home concept in the system improves the standard living at home. Whenever a person come in front of the house the PIR motion detector sensor detect the person and a message will send to the house owner and he can see the person through the camera in front of the house. The camera is accessed to the web page and also the light, fan, door lock, alarm can be controlled with the web page. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of

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installation. According to the priority of the person the owner can control the electrical appliances. the door by entering password on the keypad and use the home appliances depending on the priority set by the owner.

Keywords: MQ, ESP8266, ARDUINO UNO.

1. INTRODUCTION:

An efficient, low power consumption and low cost embedded access control system for Smart home security and remote monitoring[3] based on motion detection is very important for wide range of commercial and security application. Many countries are gradually adopting smart home security control system. Today most of the home and office appliances that we interact with contain microprocessors. All of these appliances have some user interface, but many users become frustrated with the difficulty of using the complex functions of their appliances. We are developing a framework that allows users to interact with appliances through a separate user interface device that they are already carrying. Smart phones are good candidates for providing interfaces because they are common, have communication capabilities to allow connection to appliances, and are already being used for a wide range of different applications. Our framework includes an abstract specification language for describing appliances, a two-way communication protocol, and automatic interface generation software that allows user interfaces to be customized to users and the devices they are using [2]. The most important part of any home security system is accurately detecting visitor who enter and leave through the door. An entrance guard can be managed remotely, detecting visitors at Door and alerting to user via mobile phone is the most natural way to perform security. The proposed system have added features like view video stream through mobile phone [3]. Additionally, voice alert or siren activated to alert neighbors when intruder detected. The system identifies the visitor's presence, capture and transfers the image through email automatically to home owner to recognize the visitors. The system also generates voice output whenever a person tries to enter into the house. The user can directly login and interact with the embedded device in real time without the need to maintain an additional server. It has a variety of features such as energy efficient, intelligence, low cost, portability and high performance.

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The primary aim is to develop feasible solution to transform a traditional doorbell into an intelligent bell which provides information of the stranger to home owner thereby enabling him to answer the door through smart phone with easy user interface. The design solution in IoT system is multidisciplinary and is scattered through various domain specific challenges. There are many researches that anticipate the failure of wireless network which is growing as the use of technology evolves. The main factors are network topology, failure of network measurement and cost minimization which decides the efficiency of the network and data delivery. The data delivered or exchanged over internet can be audio, video or an image file. Internet of Things (IoT) conceptualizes the idea of remotely connecting and monitoring real world objects (things) through the Internet. When it comes to our house, this concept can be aptly incorporated to make it smarter, safer and automated. Nowadays home and building automation systems are used more and more. That provide increased comfort especially when employed in a private home. An important factor to consider when we talk about home automation is Security. Home security is a very important feature of home automation and maybe the most crucial one. Home security made drastic changes in the past few decades and continue to advance much more in the coming years. Previously home security systems meant having an alarm that would go off when somebody would break in but a smart secure home can do much more than that. Therefore the main objective of our work is to design a system which can alert the owner and others of an intruder break-in by sending a notification to their smart phones. The owner will also have the ability to stop or start the alarm remotely using just his smart phone. This system will help the users to safeguard their homes by placing the system on the doors and monitoring the activity through their smart phones.

2. LITERATURE SURVEY

In [1], Raj G Anvekar and Dr. Rajeshwari M Banakar propose an IoT enabled design framework for security sector. The conceptual model developed for the IoT based Home Security System has been built using the fundamentals of IoT Layered Architecture feature. The system requires extremely low maintenance and can be employed in smart homes of tomorrow. One of the prominent application segment of Internet of Things framework is in the Security Sector. It is important to arrive at a unique low cost

solution to prevent theft and ensure security to members of the home. The Internet of Things (IoT) Layered Architecture based design approach assists the system designer to conveniently differentiate the system component requirements distinctly at various layers. This paper highlights the model driven development process for Home Security System. It remarks the uses of customers end application such as Telegram to securely transmit information through layers of IoT architecture. This paper aims at providing a low-power, cost effective and unobtrusive IoT based home security system which assists in presence detection, identification and authentication of stranger. The proposed solution makes use of USB Webcam as an image capturing unit, Electric Door Strike as an actuator and Telegram which has an amazing feature as Telegram Bot which provide APIs to build solutions which is compatible with Raspberry Pi IoT infrastructure.

In [2], Ahmed ElShafee, Karim Alaa Hamed presents a design and prototype implementation of new home automation system that uses Wi-Fi technology as a network infrastructure connecting its parts. The proposed system consists of two main components; the first part is the server (web server), which presents system core that manages, controls, and monitors users‟ home. Users and system administrator can locally (LAN) or remotely (internet) manages and control system code. Second part is hardware interface module, which provides appropriate interface to sensors and actuator of home automation system. Unlike most of available home automation system in the market the proposed system is scalable that one server can manage many hardware interface modules as long as it exists on Wi-Fi network coverage. System supports a wide range of home automation devices like power management components, and security components. The proposed system is better from the scalability and flexibility point of view than the commercially available home automation system.

In [3] , Jayashri and Arvind proposes the use GSM based security system to enhance the security. It illustrates two methods of home

security system, first one has a webcam which captures the motion and sends a mail to the owner of house. Second uses GSM-GPS module to send SMS to the owner with the assistance of sensor and micro-controller. They (2013) have implemented a fingerprint based authentication system to unlock a door. This system helps users by only allowing the users whose fingerprint are authorized by the owner of the house. This system can also be used to monitor who all have used the sensor to gained entry into the house. The system is coupled with a few more home protection features such as gas leakage and fire accidents. Although a good system, fingerprint sensors are expensive and complex (as they need increased sensor resolution) to integrate into an IoT setup. Some experts also argue that only relying on a fingerprint sensor is not wise as it is relatively easy to lift someone‟s fingerprints and replicate them, which is why it is always advised to use fingerprint scanners in a two factor authentication systems where an additional layer of security is available in the form of PIN, pass code, voice recognition, etc.

In [4], author proposed the home appliance control system based on GSM network technology is used for transmission purpose of SMS from the sender to the receiver. SMS sending and receiving is used for universal access of appliances which is allowing breach control at home. A processing unit 8051 microcontroller and a communication module that used GSM module. The SMS issued for status reporting in case of power failure. Mobile user will transmits message SMS using GSM technology and it will call GSM Module and it will get activated. The mode of communication is wireless and main mechanism works on the GSM technology. Cell phone has a SIM card and also consist GSM subscription. User transmits the instructions through SMS and then the system takes action against those given instructions. GSM technology has provide the benefit that the system may be accessible in remote areas as well. The programming and also interfacing of microcontroller has been monitored during the implementation.

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3. METHODOLOGY

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OPERATION:

In designing a home security and automation system one or more platforms are used in order to build a reliable and flexible system that can be easily operated and adapted as a security system. Therefore, for the purpose of this project some specific deliberate choices were made on the type of platforms, hardware components and mode of operation of the home security system.

A:PRELIMINARY CONSIDERATIONS Before the actual design of the project work, specific deliberate choices in selection of appropriate implementation platforms and hardware components were made. Priority was given to low cost availability, reliability, flexibility and simplicity in all these selections.

B: SYSTEM DESCRIPTION The PIR sensor can detect the presence of human being who enter into the house. The Raspberry Pi camera module can capture the images and live streaming videos. The owner can directly login and interact with the webpage and the control unit provided. The images captured and the videos recorded will be directly streamed on user pre-decided webpage on smart phone. User can access the video

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directly using the static IP address or can also stream on local domain with the help of websites.

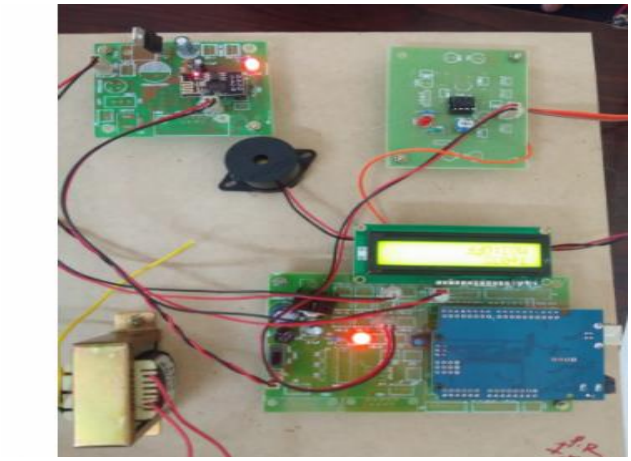

Fig.1. Hardware kit image.

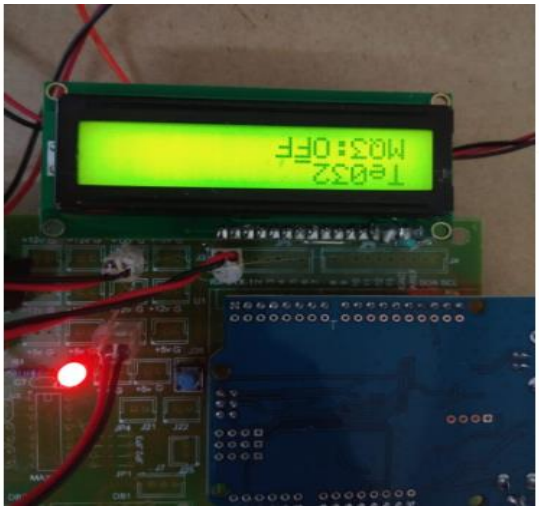

Fig.2. LCD display parameters.

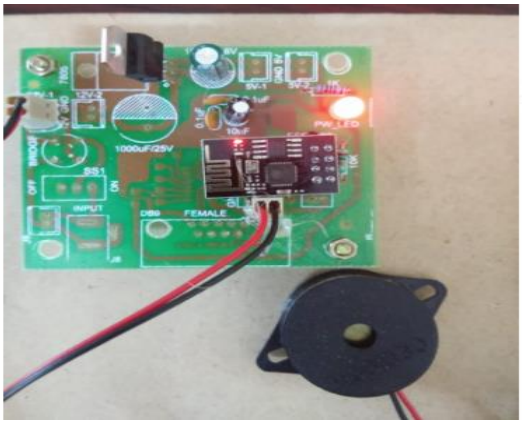

Fig.3. WIFI module.

CONCLUSION

Security is of essential importance in today's world, traditional system has attempted to provide the same using technologies such as microcontroller and updated versions of the same. The Proposed System provides Security to the house by detecting the presence of any intruder. If any intruder is detected, an alarm is raised and the owner and law enforcements are notified via message. The proposed work eliminates the overhead associated with traditional system such as high down time during repair and maintenance and any kind of device tampering that an intruder or hacker can do to the system. The proposed work makes use of Arduino uno as the processor and ATmega 328 microcontroller controller and since it being the latest technology it provides more compatibility with the latest devices and

sensor and also provides more room for future enhancement such as exploiting more of Raspberry PI's functionality in areas of efficient consumption of electricity by automating the control of lights for much efficient power management. Scope of this project can be expanded to many areas by not restricting to only home. The next phase for the Home security and automation market will occur based on a few key improvements in the technology available in automation and security, such as improvement in Wireless Automation solutions as well as lowering of price points as the market begins to accept Home automation and security usage in larger volumes.

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