SMART DOOR LOCK SYSTEM

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Abstract – The concept Door locking and unlocking system uses GSM to open and close the door. In addition to this the security will be provided using GSM in case of any unauthorized access. The main aim of this project is to provide security at homes, offices etc. The system automatically locks the door as soon as it receives predefined message from the user. The user will have to first register. His information will be stored in database. Whenever the message will be received for the registered number, the controller will accordingly give instruction to solenoid lock solenoid lock will then perform action on door either locking or unlocking. In case of any illegally attempt to try open door then vibration sensor detect and send alert message to user through GSM Modem.

Keywords – Global System for Mobile Communication (GSM), Microcontroller, Solenoid lock, Vibration Sensor, Mobile Phone.

I.INTRODUCTION

The system automatically locks and unlocks the door as soon as it receives a predefined message from the user. The system provide security at homes, offices etc. There are many systems which has been developed till now which were working on the technologies such as entering passwords, wireless networks etc. but the disadvantages shown by them were not so secure also it required physical presence. Here we are developing a system which is more secure and cost efficient.

Proposed System

The project intends to interface the microcontroller with the GSM modem and lock/unlock the solenoid lock by sending the predefined messages from the mobile to the controlling unit. The project uses the GSM technology and Embedded Systems to design this application. The main objective of this project is to design a system that continuously checks the messages if any, received from the user mobile and change the status of the solenoid lock as per the message received from the mobile. The main concept behind the project is receiving the sent SMS and processing it further as required to perform several operations. The type of the operation to be performed depends on the nature of the SMS sent. The principle in which the project is based is fairly simple. First, the sent SMS is stored and polled from the receiver mobile station and then the required control signal is Generated and sent to the intermediate hardware that we have designed according to the command received in form of the sent message. The messages are sent from the mobile set that contain commands in written formwhich are then processed accordingly to perform the required task.

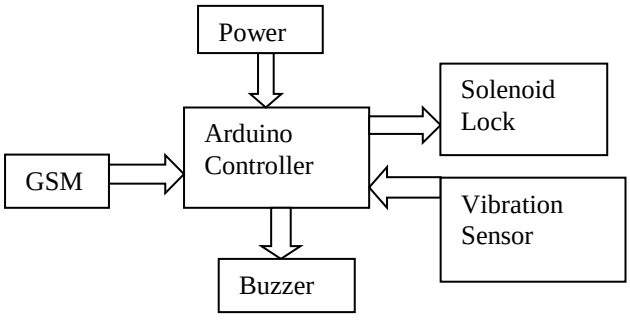


Fig: Block Diagram for Smart Door Lock System

II.LITERATURE SURVEY

Design and construction of door locking security system using GSM[1]: - door locking, security, GSM, microcontroller and Solenoid Lock— This project presents a prototype security door that can be remotely controlled by a GSM phone set acting as the transmitter and another GSM phone set with a dual tone multi-frequency (DTMF) connected to the door motor through a DTMF decoder interfaced with microcontroller unit(Arduino) and a Solenoid Lock .The design is composed of four main functional modules, namely; the GSM module, the decoding module, controlling module and the switching module. The GSM module act as both transmitting and receiving unit employs the use of a mobile phone set serving as the communication device between the user at one end and the object of access (i.e. the door) at the other receiving end. The decoding module and the controlling module are made possible using modern integrated circuit chips ensuring proper conversion of signal to binary codes, enabling the microcontroller to communicate properly with the switching device responsible for opening and closing the door. The codes for this project was written in assembly language with Visual basic software and compiled with M-IDE studio for MC-51compiler which work perfectly with Window XP environment, the program run without error before it was burn onto the microcontroller using a device called the programmer by placing the microcontroller on it socket equal to the pin number.

Android based home door locks application via Bluetooth for disabled people[2]: - Bluetooth and android controller--This paper discusses about an ongoing project that serves the needs of people with physical disabilities at home. It uses the Bluetooth technology to establish communication between user's Smartphone and controller board. The prototype support manual controlling and microcontroller controlling to lock and unlock home door. By connecting the circuit with a relay board and connection to the Arduino controller board it can be controlled by a Bluetooth available to provide remote access from tablet or smartphone. This paper addresses the development and the functionality of the Android-based application (Android app) to assist disabled people gain control of their living area.

Password based security lock system: -motor microcontroller, LCD, keypad[3]--The necessity of a low cost electronic home security system designed in co-ordination with other security measures is always there in our society to reduce the risk of home intrusion. Keeping this problem in mind, we are working on a project on automatic password based door lock system. We want to utilize the electronic technology to build an integrated and fully customized home security system at a reasonable cost. We hope this project will be useful in keeping thieves, dacoits and other sort of dangers at bay.

Microcontroller Based Home Security System with GSM Technology[4]:-Home, Securıty, System, Control, Microcontroller, Bluetooth, GSM--In this paper, design and implement of a microcontroller based home security system with GSM technology have been presented and analyzed. Two microcontrollers with other peripheral devices which include Light Emitting Diode (LED), Liquid Crystal Display (LCD), Buzzer and Global System for Mobile Communication (GSM) Module are responsible for reliable operation of the proposed security system. In addition, a mobile phone is interfaced with microcontroller through a Bluetooth device in order to control the system. Moreover, a manual keypad is another way to lock or unlock the system. A Compiler Code Vision AVR is used to design a program that controls the system along with maintaining all security functions. The designed program is applied in Proteus Software for simulation. At last, the results of practical circuit show the proper functions and also verify the reliable security within reasonable cost.

Security and Usability Improvement on a Digital Door Lock System based on Internet of Things[5]:- Internet of Things, Door lock system, Digital door lock--Recently, digital door locks have been widely used as part of the IoT (Internet of Things). However, the media has reported digital door locks being opened by invalid users to invade homes and offices. In this study, a digital door lock system that can work with the IoT environment is proposed. It is designed and implemented to enhance security and convenience. The proposed system provides strengthened security functions that can transfer recorded images to a user's mobile device when an invalid user attempts an illegal operation; it can

also deliver alarm information to the mobile device when the door lock is physically damaged. The proposed system enables a user to check the access information and remotely operate the door lock to enhance convenience.

Face recognition based on auto-switching magnetic door lock system using microcontroller[6]:- Face recognition system is widely used for human identification due to its capability to measure and subsequently identifies human identification especially for security purposes. This paper presents the development of Graphical User Interface (GUI) based on face recognition system and Peripheral Interface Controller (PIC) as an input/output carrier to switch on/off magnetic lock for door lock security system. The development is implemented by interfacing GUI built in MATLABR2009a with microcontroller to auto-switching magnetic lock for door lock security system. USB serial communication is used to interface between GUI and PIC microcontroller that allows input data transmission from GUI to microcontroller. The developed system shows that the auto-switching mode transmission being implemented via PIC microcontroller and USB serial communication cable. It was also found that GUI can successfully switch on and off the magnetic lock when an authorized image from GUI database is identified.

Control Access and Security by Using Android Application[7]:- – The concept Door locking and unlocking system uses GPRS to open and close the door. In addition to this the security will be provided using GSM in case of any unauthorized access. The main aim of this project is to provide security at homes, offices etc. The system automatically locks the door as soon as it receives predefined message from the user. The user will have to first register. His information will be stored in database. Whenever the message will be received for the registered number, the controller will accordingly give instruction to DC motor. DC motor will then perform action on door either locking or unlocking. In case of unauthorized access, the IR sensor will sense the action and send the alert message to the registered user using GSM.

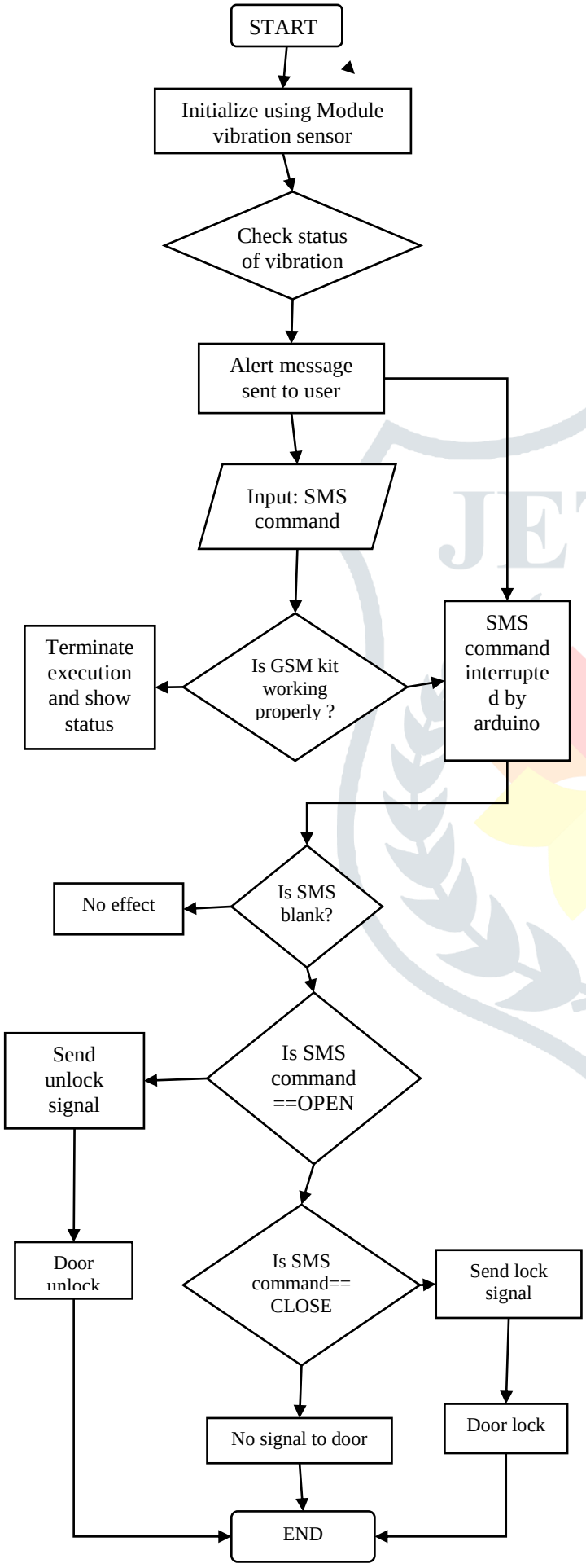
III. WORKING

The smart door lock system based on sending the SMS from the mobile user. The sender who is operating the system can lock or unlock the door using the SMS system which is based on the GSM service. The users will be already registered in the android application which will make them authenticated users.. Also all the information regarding the users will be present in the database.

As soon as the user will send the SMS for locking door through mobile phone then controller detect that string and Lock solenoid lock by sending command through Arduino controller. Same operation perform for opening the door when user send command to open the door it open solenoid lock by sending command through Arduino controller.

We are also used vibration sensor for detecting any theft on the door. If any person tries to attack on door or forcefully opens the door, then the vibration sensor detect it and send alert message to user mobile phone through GSM module also buzzer turn on for indication of theft.

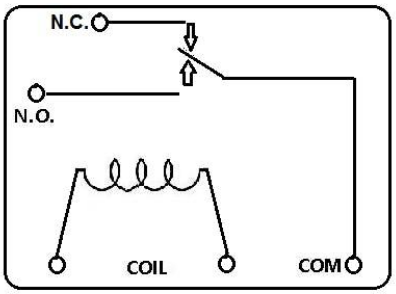
IV. FLOWCHART



V. COMPONENTS

A. Relay Switch

Relay is an electromagnetic device which is used to isolate two circuits electrically and connect them magnetically. They are very useful devices and allow one circuit to switch another one while they are completely separate. They are often used to interface an electronic circuit (working at a low voltage) to an electrical circuit which works at very high voltage. For example, a relay can make a 5 V DC battery circuit to switch a 230V AC mains circuit



represents the terminals of the relay

B. Arduino UNO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply
connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

C. Global System for Mobile Communication

GSM is a mobile communication modem; it is stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz, 900MHz, 1800MHz and 1900MHz frequency bands.

GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. A GSM

digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates.

D. Vibration Sensor

This sensor module produce logic states depends on vibration and external force applied on it. When there is no vibration this module gives logic LOW output. When it feels vibration then output of this module goes to logic HIGH. The working bias of this circuit is between 3.3V to 5V DC.

E. Solenoid Lock

A solenoid is a very simple component, that includes a coil of wire that is covered around a core made out of a metal. When a current is applied to the solenoid, it has the effect of assembling a consistent magnetic field. Electricity changes to magnetism then it changes to electricity and, therefore, these two forces are united into one.

An attractive thing about the uniform field in a solenoid is that, if the solenoid has an immeasurable length, the magnetic field would be the similar everywhere along the element. In a solenoid, sometimes this translates to very small electrical components being able to do a marvelous amount of work. For instance, a powerful solenoid can simply slam shut a valve that would be demanding for even the burliest plumber to close by hand.

VI. CONCLUSION AND FUTURE SCOPE

The goal of this study is to propose a system that can help disabled people to open a magnetic door wirelessly using Android smartphone. The range and security aspects were considered through the use of GSM technology that is embedded in the mobile device. The system was able to Lock or Unlock the door from anywhere around by just pressing a button on a smartphone. The status of the door also has been created to make the system more complete.

In future, the Lock Door Apps should offer assistance in controlling more doors, windows and basic home electronic appliances. Battery backup system should also be considered to ensure the completeness of the system.

We can implement this idea along with an alarm system to alert driver so that he can take appropriate action according to the respective situation.

We can also implement this idea along with businesses for locking and unlocking the warehouse
(godown) doors from his/her office which can be located far from the warehouse.

We can also automatized the braking system to save someone life.

We can also implement advanced sensors to implement this idea in real life scenarios.
Sensors such as laser beam, FM frequencies,
Etc. Can be used to implement in real life
For longer distance.
We also can implement a horn along with the alarm when sensors detect something to alert
Driver as well as any person or animal if any
Detected by the sensors.

VII. REFERENCES

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