Abstract:

Lifestyle in the modern society along with human behavior and thinking is changing dramatically with the advancement of technology, and the concept of a simple home is changing into a smart home. The advancement of technology has increased the safety and security of people along with their belongings. Safety and Security describes protection of life and property. The wireless communication is increasing day by day. Mobile phones today are not just used to make calls. The use of mobile phones is changing with the development of technology and they can be used for different purposes as well. This has motivated us to use mobile phones to remotely control household security system and to receive a feedback SMS about the security and safety of the house. In this proposal paper we describe a remote security system which can receive feedback from different household security modules and sensors by sending a SMS to user mobile phone and monitor the safety and security of the house just by SMS. The application consisted of two units, the microcontroller and the mobile unit. The mobile unit acted as a recipient to get responses from the microcontroller.

In addition to this, the microcontroller unit was responsible for reading input from the sensors. The Arduino platform was used as the system platform with Arduino Uno Board as the microcontroller board. The SIM900 GPRS/GSM module was used to communicate be-tween the microcontroller unit and the mobile unit. With the help of the GSM network, a mobile can be used to implement a smart home by measuring different type of devices and sensors and getting alerts as SMS. In addition, multiple sensors are used as a temp detector, motion detector and intrusion detector which trigger the alarm upon reaching the critical limit. The microcontroller would then control the home appliances based on the information given to it and send a feedback during a security breach and it also send a feedback during gas leakage or if fire takes place. The proposed solution is easy to use, simple, secure, and robust. The project could be extended further by using wireless communication or Internet communication along with the GSM network to reduce the limitation in the absence of GSM network.

Project Title:

In this project proposal, we will make a system that will receive information about home safety and security system using GSM technology. We will also show that we can receive SMS feedback from sensors installed at home. Even in the absence of an android phone or any other phone by receiving a normal SMS. The advantage of using GSM technology is that we can receive SMS feedback from remote places anywhere in the world. This system will allow the owner to receive a feedback status of the home. For example: If one of the sensor sense a change in temperature in the living room. It will send SMS to the owner of the house and alert him about the condition. We are using an antitheft reporting system which will report the owner by ringing an alarm and by sending an SMS. Also for the safety system in case of fire or gas leakage it will report the owner by sending a SMS and also by ringing an alarm to alert the surroundings. An LCD will be giving real time sensor data. Thus by using GSM technology, it provides the wireless feedback to the owner of the house.

Goals:

- To send feedback alerts to the Customer.
- To measure the sensitivity of the sensor.
- To send alerts to owner using GSM technology.

Objectives:

For making the system workable we require various methodologies of Arduino, GSM and different detecting sensors to make the security and safety of the industry stronger in reliable rates.

Functional Requirements*:*

Here is the list of all the functional requirements of the system.

- ***The system should be able to register home owner mobile number.***
- The system should verify the home owner mobile number by sending a verification code on his mobile number.
- The system should only save mobile number which is verified by the random verification code.
- If the owner didn't receive the verification code in time. There should be an option to send a random code again. And there should be another option to change the mobile number as well.
- The system should not store a same mobile number twice.
- The system should not accept a number with a wrong format.
- The system should not accept any wrong inputs.
- When the system is started for the first time it will only show registration screen. If the system is already registered with the home owner mobile number, it will just show the main screen.
- The home owner should be able to change his mobile number later.
- The system should be pin code protected.
- The pin code must be registered along with the mobile phone number. Each time the home owner wants to change something. He will be asked to enter pin code. If the user forgets the pin code, he can choose the option to enter mobile number.
- The home owner can also change the pin code later in the menu.
- The system will also display warnings and correction messages to the user.
- The system will be able to send messages to the home owner mobile number.
- The system should scan each sensor. If it detects any change it will inform the home owner about it by sending a predefined text message.
- The system should also able to ring alarm in case of emergency. It will alert the surroundings.
- The system should an interactive screen for graphical interface. The home owner can use graphical interface to view all the necessary information about the system.
- The system should display information about the sensors in use. It should also display live sensor feed on the display.
- The system should receive inputs with the help of keypad.
- The system should have an option to add neighbors.
- The system should be able to delete an add neighbors later in the menu.
- The system should detect flame around the room and inform user about.
- The system should be able to detect knock on the front door and inform user about it.

Non Functional Requirements:

Here is the list of non-functional requirements that can be achieved with the help of GSM security system.

Security

This system will increase the intensity of the security because the owner of the house will be notified of any suspicious activity within seconds. There will be a lot more time to perform action based on the activity.

User Friendly

The system will have a user friendly interface. It will consist of an LCD that will display necessary information to the user. The user can use LCD to view sensor details. If any threat is detected the user will be notified with the help LCD and SMS.

Usability

The system will be easy to use because user can view sensor data on the LCD anytime.

Time Saving

GSM security system is so much time saving in many aspects of life because it will inform the owner about any suspicious activity. The user will be alerted within seconds of time. It will also trigger built in alarm system to alert the surroundings.

No expertise

To use the system, you don’t need to be an expert or need to hire an expert to use the system. Every person can blend in without facing any problems.

Flexible

The GSM security system is prone to changes. Its unique design allows it to expand in the future. The numbers of sensors connected to the system and number of users using the system can be increased.

Reliable

The GSM security system will be reliable because it can perform things without the need of internet. Because the system uses GSM which is available all around the world. So the user can be notified no matter where he/she is.

Portable

The GSM security system has a portable design. It can be carried anywhere without the need of new product. The sensor on the system are detachable and can be placed according the technical feasibility.

Major Working Components:

This project is divided into two main parts:

1) Hardware
2) Software

Hardware

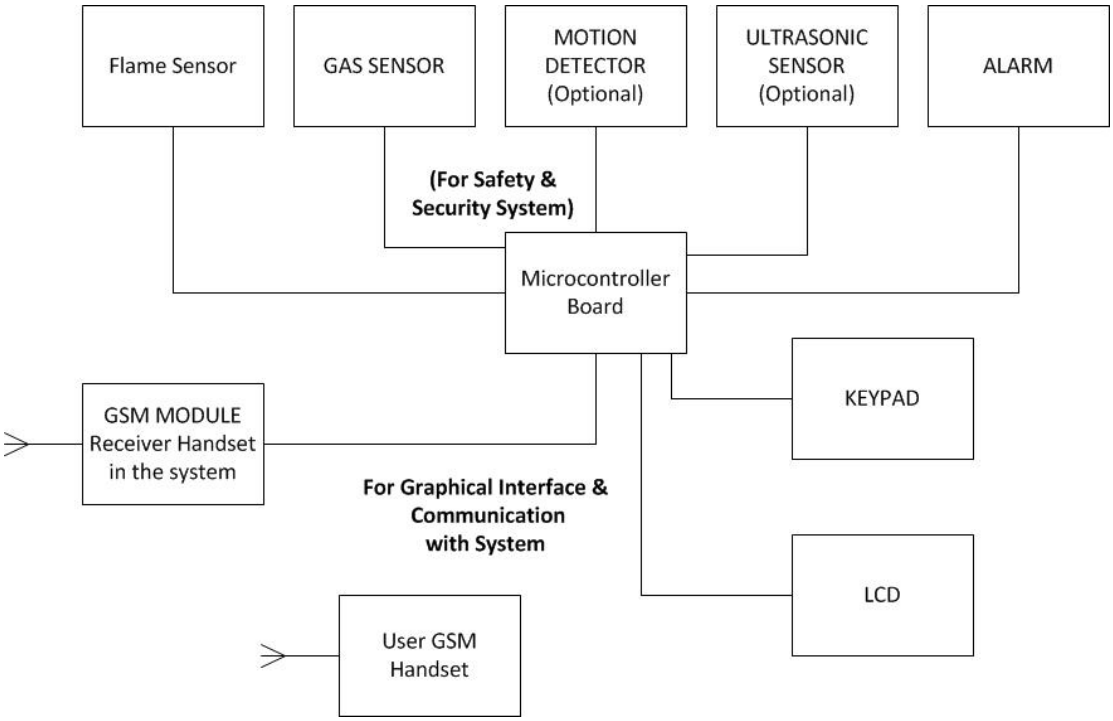
The system has two parts, namely; hardware and software. The hardware architecture consists of a stand-alone embedded system that is based on 8-bit microcontroller (ATMega2560), a GSM handset with GSM Modem (SIM900), sensors (MQ2, Temperature and Flame sensors).

Software

The software part consists of programming in Arduino. The GSM modem provides the communication medium between the home owner and the system by means of SMS. For the home security and safety system, in case of security breach, fire and gas leakage microcontroller will ring the alarm and send a feedback message through the GSM modem to the GSM handset. If the system detects any suspicious activity, it will also notify the owner of the house.

Application Architecture:

An overview of the application architecture. Figure describing the communication between each components of the system.



Project/Product Feasibility Report

GSM Security is one kind of the project that will allow the consumer to get notified about the house security situations like knocks on the door. If there is any fire or gas leakage in any part of the house the person will be notified by SMS. The system will send alerts whenever possible. The system will also detect suspicious motion using motion sensors. This project will hopefully work on every mobile phones with working GSM connection and SMS service enables. The project is not bound to any operating system like IOS, Android or Symbian.
There are many types of feasibilities:

- Technical
- Operational
- Economic
- Schedule
- Specification
- Information
- Motivational
- Legal and Ethical

Technical Feasibility

Technically GSM Security System can be established within the given time frame. Because we have gained all the technical knowledge that is required to keep the project going. All the technology, tools and help is available to complete the project. As far as we know the project is technically feasible and can perform well in the environment. Somehow there are some technicalities in the project like controlling the Arduino hardware side. Because sometime hardware shows very unique behaviors in terms of performing exact to the point. A lot of testing needed to be done in this area before launching the product in the market.

Operational Feasibility

GSM Security can be operated by anyone who have just a little knowledge about of cell phones. This project is not bound to any specific mobile operating system like IOS, Android or Symbian. It can work on any cellphone which has a working GSM connection and SMS services. So we can conclude that the project is operationally feasible. The project is simply operational in any type of environment because it can withstand summer heat and winter cold because it will be working indoors. It is also portable which helps when the system needed to be moved somewhere else.

Economic Feasibility

The project will be cost efficient for everyone because it just requires an SMS service which is fairly cheap by using SMS bundles. And everyone now a day owns a mobile phone including SMS service on it. The hardware device will be one time cost and SMS services can be purchased using bundles on monthly and yearly basis which totally depends on your need. It would be beneficial for a lot of people because it is not bound by any operating system. This system can generate good revenue because of its one-time purchase cost and doesn’t require a lot

maintenance cost. However New updates and features can be installed with extra cost. So this project is economically feasible.

Schedule Feasibility

The project will be completed on the given schedule if everything goes right. We hope that time will not be a barrier to our project completion. We will manage our project on time and reach our milestone with flying colors. The project will be completed in 300 days. In which proposal took 30 days and parts ordering and delivery took 25 days. Requirement gathering took 40 days. Designing will take 60 days. Development will take 120 days. Testing will take 25 days.

Specification Feasibility

The requirements for GSM Security System are concise and clear. Every specification of hardware and software is clearly defined.

Information Feasibility

The information present in this documentation is authentic. Right piece of equipment's and tools will be used to complete the system.

Motivational Feasibility

Motivation is a key factor to get started in an6y project. The individuals working on the project are highly motivated and love the work they do. They will not give up until unless the project is in its working state. The team members are motivated enough to complete the project in given time frame.

Legal & Ethical Feasibility

The GSM Security System is free of any legal and copyrighted content. The software tools and hardware parts required to build this project are open-source and available on open market. They are free to use and doesn't require any license or contract. The hardware and software tools are not bounded by any copyright law.