

# GSM based Automation

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**Abstract-**The automation is a technological advance that is changing the life of the person drastically. The market trend is in favor of such technological advances that ultimately enhance the life. This paper is about the introduction to the newer technology that contributes to the field of the automation. Also, how it is used to develop the exceptionally advance product. The aim is to motivate the research in this area. The methodology that is being used to develop the content of this paper is the information being collected from the different sources like the existing research paper, along with the observation of the latest trend in the market in the same field. The pace of the development is very fast but it is not being used in industry widely and at the small scale. The content of the paper will make industry aware of the technology like GSM can also be used to automate the electrical appliances at the different scale .

**Keyword-**GSM ,Android, Arduino, automation..

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## I. INTRODUCTION

The Term “automation” is very common terminology that we come across very often. It is Terminology that is being used in order to represent the automated activities across the globe. It refer to the automation of the several electrical appliances like light, fan, Television, Air conditioner, Refrigerator . This automation of electrical appliances makes life of the human stress free. Also, Make thing easily accessible and easy to operate. The electricity is the resource that is very scarce, expensive. So, there is need to prevent it and use it wisely. Automation will be helping us to achieve our goal of using electrical appliances wisely, saving electricity and make life of human easy.

The paper is about the “Automation of electrical appliances using GSM” .This paper include the information regarding the automation of the electrical appliances across houses using the Technology like GSM, Android and Arduino as connectivity, software and hardware component respectively. The GSM is a technology that is being used since the long back. This technology is also considered as one of the reliable services from the expert.As of 2014 it has become the default global standard for mobile communications - with over 90% market share, operating in over 219 countries and territories. Android is mobile based operating system that is used by wide range of people. An April–May 2013 survey of mobile application developers found that 71% of developers create applications for Android and a 2015 survey found that 40% of full-time professional developers see Android as their priority target platform, which is

comparable to Apple's IOS on 37% with both platforms far above others .Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

The scope of existing automation system is restricted to the class of the people without any disability. This is not being developed for the disabled people across the globe. The same is true for the old age people . Since the technology is currently being used by general people only. There is need to introduce the same technology for the disable and old aged people across globe. This paper is to propose the overall architecture about the usage of the automation in context of disabled people. The description regarding the design and implementation of the automation for the disabled people. This architecture, design and implementation part include the Android, Arduino, and GSM as technology.

The building of the smart home technology is also required to provide the full fledged service to disabled and old aged person similar to that of general public .This area of service is neglected by the existing company that build the automation of the product.In that context the paper provide the brief overview of services that will overcome the drawback of the existing home automation system. Also, still there is no such automation system that provides any service associated with blind person. This paper also provide the brief idea about the building of the automation system that is voice operated and even blind person is also able to handle every electronic appliance without any other person help. So, by reading this paper the user will have

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complete idea about the design and the implementation of such system for the disabled and old age personal.

## II. PROBLEM

While automation is far from mainstream, more and more smart home technology is starting to appear in the market. Energy supplier Npower recently started offering Nest, the smart central heating controller from Google in the UK, and last year, rival British Gas launched its internet-connected central heating system, Hive. But beyond the big energy providers, a new industry is emerging to integrate computer control into the home. In the past, companies such as Lurton were synonymous with intelligent lighting installed in high-end homes. But it currently suffer from series of problem that are to be listed in the same section in detail

The problem with the existing automation system is with respect to the range over which operate depending on the technology that is being used either it is WI-FI, Zig-bee, Bluetooth .This feature are currently being used in SmartPhone, tablets, Camera, Digital audio player. The automation based on Wi-Fi can connect to a network resource such as the Internet via a wireless network access point. Such an access point (or hotspot) has a range of about 20 meters (66 feet) indoors and a greater range outdoors. But there is no such restriction are provided in context of usage of GSM for the connectivity.

The interface of the current automation system is such that it is only suitable for the general user's to interact with the electronic .There is no such privilege that even disabled and old age person are allowed to use such system. This paper will provide the complete overview of designing of the interface along the technology being used to develop. The interface is such that even blind person are also allowed to use the system as efficiently as general user because for such user the interface will be voice operated. The same feature that is being used by the general user is also used by blind person.

Another major problem with the existing system is that the services provided by the system are very less and in contrast the prices are very high comparatively. For example here are few devices that currently exist in market and being used as well. This include Smart Lighting The above-mentioned smart outlets are great for controlling your "dumb" lamps and light stands, but smart home automation has progressed beyond that The most-recommended solution is the Philips Hue Lightbulb, which is an LED bulb designed to use up to 80% less energy than a traditional bulb. Using the smartphone app, you can control it remotely or set it to trigger according to a timer. One bulb is currently priced at \$20. Smart Outlets The most basic smart home component is the smart outlet or

smart plug, which are both the same thing: an extension to your wall outlets that provide better control over the appliances and devices plugged into said outlets .The Belkin WeMo Switch is the most popular one by a long shot, not because it's the cheapest (it costs \$45) but because it has the best marketing and promotion surrounding it, plus it's easy to use and has a great name. Smart sensor another key component of smart home automation is the sensor. There are a plethora of available sensor types depending on the smart home hub that you choose, ranging from motion sensors to temperature sensors, from humidity sensors to weight sensors.

Standard	Family	Downlink (Mbps)	Uplink (Mbps)	Coverage
WiFi	802.11	11/54/150/300		100m
WiMAX	802.16e	144	35	10km
UMTS (3G) /HSPA (3.5G)	3GPP	14.4	5.76	30km
LTE (4G)	3GPP	360	80	30km

Fig.1

## III. SOLUTION

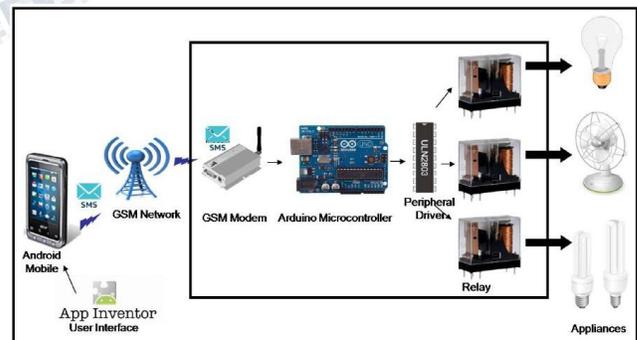


Fig.2

The problem regarding the area being covered by the existing home automation is restricted as it is described in previous section. But this problem is overcome in this paper by using the GSM over other technology as described previously. Since the GSM is not restricted by coverage area as we all use cell phone they are always connected irrespective of the position in world. So the solution being provided to overcome the given problem is

to automate the devices using GSM and stay connected and always updated about the status of the device. If required to change the state of the device even a normal SMS services in case of ordinary phone and in case of android based smart phone through your application you can change the state of the devices immediately. Also the application will provide complete view of the available appliances based on that they will be selecting whether the appliances are turned ON/OFF. For example, You are employee of certain organization and you leave from the office at evening say 5:00 pm. So, you can instantly turn on air conditioner of your room from office itself so that till you reach your home the room temperature is already appropriate as per your requirement.

The cost of the system that is being proposed is very less as compared to the existing system and provide the centralized control over the entire devices available in house with proper classification of the no of the devices available in room .So there is no problem regarding the selection of the device.

The proper module is provided in android based application for the classification of the application based on house module or the factory module that industry owner will propose. In one touch you can change your access to the specific room to specific device and that to with the specific authentication and authorization. The user will just need to send SMS regarding the activity or action that is intended to perform. But most interesting thing about this system is that every message is required to generate is actually coded internally along with the corresponding AT Command. So user need to press ON/OFF button available in user interface and SMS will automatically generate internally and action is performed.

This provide the extension to the Non-Smartphone user such that, They are also allowed to control automation system from any part of the world through Normal SMS services. They are also updated if the notification service is ON. For Smart Phone user will receive the notification regarding the current status if they had activated the notification for the automation application. If they had not activated the notification than they are not unnecessarily disturbed, they will receive notification when they turn on their application.

The advantage of the existing system is not an headache for user since the user need not to request for the customization of the application. Because the application is already designed with the expected customized module as per classification of user belonging to the different. But, in extreme cases the customization if needed can be done based user expectation. The initial module is held with the module consisting of the classification as 1BHK, 2BHK, 3BHK and 1RK flat.

#### IV. DETAIL

The existing home automation systems that are based on Wi-Fi and Bluetooth have support from the various programming language and cross platform across several mobile phone. The paper provide the detail about the architecture of the automation using the GSM along with continue the support to the system by the latest rising mobile platform like Android. So, now the new platform that are being used for the automation is based on GSM over Wi-Fi and Bluetooth. Since the overall architecture include Android application including the Smart phone ,Tablet and an 8 bit microcontroller based relay driver circuit with GSM Modem, which is able to communicate with the Home Appliances over GSM Network.

The system is based on serial data transmission using SMS over GSM Network in order to facilitate the appliances control in a global network environment. The data being exchanged is exchanged over the GSM network that is very much secured then the existing platform. A user interface (UI) on the Android enabled mobile phone offers system connection and control utilities. Arduino IDE [19] for compiling C Language Code and burning HEX file into microcontroller ,serial 900 type GSM and ULN 2803 relay driver being used in development of proposed automation system. In order to control the relay the Atmega 328, a 8 bit micro-controller is used.

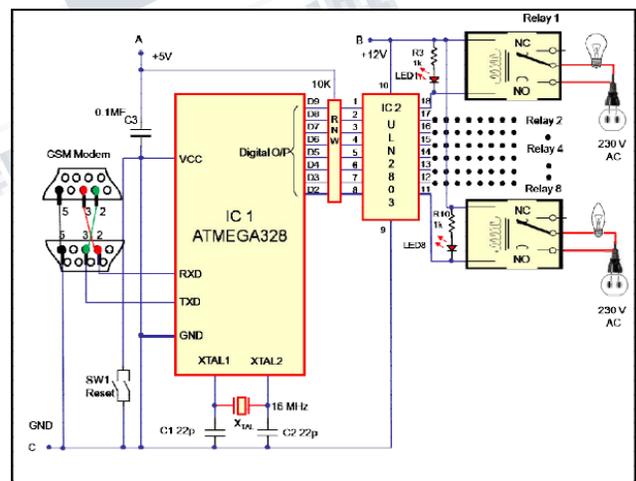


Fig.3

#### V. DEVELOPMENT PLATFORM

This section provides the detailed description regarding the platform that is to be used in order to develop the proposed automation system model. This include the Android, Arduino and GSM

### A. Android

Android mobile operating system that is widely used in world today for the touch screen handsets, Tablets. It provide the virtual keyboard to user type the text/content. It support the general action over it like touch swap to manipulate the screen object.

### B. Arduino IDE:

The open-source Arduino environment makes it easy to write code and upload it to the I/O board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and it is based on Processing, avr-gcc, and other open source software. The Arduino development environment contains a text editor for writing code, message area, text console, and toolbar with buttons for common functions, and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them. Arduino programs are written in C or C++. Arduino IDE with features such as syntax highlighting, brace matching, and automatic indentation, and it is also capable of compiling and uploading programs to the Board with a single click. Software written using Arduino a called sketches. These sketches are written in the text editor. Sketches are saved with the file extension '.ino.' It has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino environment including complete error messages and other information. The bottom right-hand corner of the window displays the current board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor. As the Arduino platform uses Atmel microcontrollers, Atmel's development environment, AVR Studio or the newer Atmel Studio, may also be used to develop software for the Arduino.

### C. GSM Modem:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities.

## VI. CONCLUSION

The paper include the information about the different technology existing in automation .Then , the drawback about the existing technology in the market Introduction to GSM and its usage in field of automation in different aspect This also provide the brief description about its design and implementation.

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