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# GSM Based Intelligent Homes

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***Abstract***

*The advantages of an intelligent home system are numerous, ranging from the management of household duties and energy economy to the management of convenience and security. As a result of the continuing development of technology, it is becoming increasingly essential for modern households. Besides contributing to rendering living simpler, it leads to an improvement in the quality of our lives. Consequently, if you are interested in modernizing your home, you should consider purchasing Intelligent home so that you may take advantage of the comfort and convenience that it provides. Our lives have been dramatically revolutionized as a result of the GSM-based Intelligent home that has enhanced the level of comfort, security, and efficiency in our houses. As a result of the numerous benefits that they offer to homeowners, home automation systems that are based on GSM technology are an option that is highly attractive for modern homes. One of the most important advantages of this system is its adaptability. On account of the fact that it is based on a wireless network, it can be accessed and controlled from any point in the world by anyone who possesses a broadband connection. In light of this, homeowners are able to monitor and control their home appliances and other electronic devices even while they are not physically present in their residence. Through the use of this technology, homeowners are able to remotely control a wide range of products, including security cameras, lights, and thermostats. It follows that homeowners are able to exercise control over the lighting, temperature, and security system even when they are not physically present in their homes. A choice like this is beneficial to the environment since it not only reduces the amount of time and effort required, but it also consumes less energy.*

**Keywords:** GDM, Intelligent Home, Arduino, Bulb, LED

## INTRODUCTION

As a result of the frenetic nature of today's society, the concept of an "intelligent Home" is becoming increasingly popular. As a result of the breakthroughs that have been made in technology, we now have the ability to control various aspects of our homes with the simple command of our voices or the press of a button. One way in which this is made feasible is by use of a Intelligent home, that's simply a network of gadgets and appliances that are capable of being operated remotely or independently [1-6].

A smart house, also known as intelligent home system for automation or domotics, is a home that makes utilization of technologies to control and regulate many aspects of the household, including the heating, lighting, and air conditioning systems, as well as the appliances and security systems. In addition to providing households with enhanced safety and energy efficiency, it also makes it possible for them to live a lifestyle that is simpler and more productive.

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One of the most significant benefits to having intelligent home system is the convenience it provides. An individual voice command, in addition to tapping on your smartphone, can be used to control a variety of devices that are located within your home. There is no need for you even get off of bed in order to ignite the coffee maker, switch on your lights, or adjust the temperature on the thermostat. This level of ease and control will be of great assistance to individuals who have a significant amount of time on their hands or who have impaired mobility [7-9].

The installation of a home automation system not only makes life more convenient, but it also makes matters more secure. Through the installation of smart cameras, motion sensors, and door/window sensors, homeowners are able to remotely watch their homes while getting alerts in the event that any suspicious behavior occurs. Furthermore, several systems allow for the locking and unlocking of doors remotely, which simplifies the process of maintaining the safety of your home even while you are not present [10-13].

An other significant advantage of intelligent home system is its ability to reduce energy consumption. Having wireless control over heating, lighting, and cooling systems allows homeowners to reduce their energy consumption and the amount of money they spend on utilities. In order to reduce the amount of energy that is wasted, you can, for instance, switch on the lights and regulate the thermostat before you leave the house, and then turn them back on when you return [14-18].

In addition to this, intelligent home might help in the management of chores around the house. If you have an intelligent vacuum cleaner, for instance, you may program it to sweep the floors at a particular time each day, which will free up your time so that you can focus on other activities. It is also possible to exercise remote control over other appliances, like washing machines and dishwashers, which makes the management and completion of home chores easier and more effective.

It is possible that some people are apprehensive about the cost and difficulty of setting up a home automation system, despite the fact that the benefits of such a system cannot be denied [6]. Despite this, there are now solutions on the market that are both user-friendly and economical, which is a direct result of the increasing appeal of intelligent home technology. There are a lot of systems that can be quickly installed and linked with the gadgets and appliances that are already in place, which makes the move to a smart home easier than it has ever been before [19-23].

The technology known as GSM (Global System for Mobile Communications) [18] has completely altered the manner in which we communicate and maintain our connections in the ultra-fast-paced world of today. This is one of the most widely used standards for mobile phone communication across the globe, accounting for more than 80 percent of the market share altogether.

One of the primary reasons for the broad acceptance of the GSM system is that it is capable of providing voice as well as data services. The result of this is that customers are able to use their mobile devices to not only make phone calls or send text messages, nevertheless to browse the internet, compose emails, and utilize other programs that require a significant amount of data [6].

The network of base stations that make up GSM technology is the technology's most important component. These base stations are deliberately located in order to give coverage to a certain geographical area. Mobile devices are able to communicate with these base stations through the use of radio waves, which enables users to maintain their connection even while they are moving around [9].

The fact that GSM technology is compatible with a wide variety of various devices is one of its most significant advantages. Whatever the brand or model of a device may be, as long as it is equipped with a SIM card, it is capable of connecting to any GSM network. Because of this, users have been able to select from a broad variety of equipment without being restricted to a particular network, which has resulted in a significant increase in their pleasure [10].

 

Additionally, in comparison to its predecessors, GSM technology provides superior call quality as well as enhanced sound clarity. This occurs as a result of the utilization of digital signal rather than analog one, whose is more prone to interfering and distortion [11].

The security of the GSM system is yet another important aspect of this technology. Authentication and encryption of conversations are performed by GSM networks through the utilization of a one-of-a-kind identifying number, which is referred to as International Mobile Subscriber Identity(IMSI). This ensures that the information may only be accessed by the intended recipient.

Global System for Mobile Communications (GSM) technology has also been instrumental in the establishment of mobile banking and online shopping. As a result of the broad accessibility of GSM networks, individuals living in distant and impoverished locations are now able to use their mobile devices to access financial services and conduct online transactions.

The way we live has been completely transformed by home automation, which has made our lives more easy and guaranteed our safety. Throughout the course of technological development, intelligent homes evolved to become more sophisticated and effective. In recent years, intelligent homes that is based on GSM technology has become increasingly popular. This system is one example of such a system.

GSM and other wireless communication technologies are frequently found in portable electronic devices such as laptops, tablets, and smartphones. As a result of its ability to facilitate communication between devices through the utilization of a mobile network, it is an ideal candidate for home automation systems. For the purpose of connecting and controlling numerous gadgets in a home remotely, the system makes use of a SIM card, which is analogous to the one that is utilized in mobile phones.

Intelligent homes that is based on GSM technology provides homeowners with a variety of advantages, which makes it an appealing choice for contemporary homes. The adaptability of this technology is among the most significant advantages it offers. Due to the fact that it is a mobile network, it is possible to access and control it from any area on the planet so long as there's an access to the internet. This enables homeowners to keep an eye on and exercise control over their home equipment and devices regardless of whether you are not physically present in their residence [12].

The convenience with which this system may be installed and operated is yet another significant advantage it offers. In contrast to conventional home automation systems, which necessitate intricate cabling and installation, this GSM-based technology is simple to set up and run. On account of the fact that it does not call for any additional wiring, it is a choice that is cost-effective for homes. In addition, the device may be easily operated using a smartphone application that is simple to use, which makes it comfortable for users of any age.

The home automation system that is based on GSM capabilities provides a wide variety of features that have the potential to make our lives more secure and comfortable. The ability to remotely operate a variety of equipment, including lighting, thermostats, surveillance cameras, as well as kitchen appliances, is made available to households by this technology [13]. The result of this is that homeowners are able to control the temperature of the room, turn on and off the lights, and monitor their house's security even if you are not physically present. The fact that it not just saves time and work but also minimizes the amount of energy that is consumed makes it an alternative that is favorable to the environment [14].

The security elements that this system possesses are among among the most important benefits that it offers. Homeowners can receive alerts and updates from the system in the event that any unexpected activity occurs, provided that they have a SIM card at their disposal. Having this on hand can be of great

 

assistance in the event of a break-in or another kind of emergency. The system can also be linked with a security system, which gives homeowners the ability to arm and disarm their security system at home from a remote location [15].

As an additional feature, the home automation system that is based on GSM also provides voice control capabilities, which makes it an ideal choice for contemporary smart houses. Homeowners are able to handle a variety of equipment in their houses without having to raise a single finger by utilizing voice commands. This feature is very helpful for individuals who have difficulties moving around themselves or who have disabilities [24].

## GSM APPLICATIONS SCENARIO

To begin, the Global System for Mobile Communications (GSM) technology has made it possible for us to send text messages and make voice conversations to anybody, anywhere on the globe. Because of this, the obstacles that distance posed to communication have been torn down, and communication has become more readily available and accessible. GSM has also made it possible for us to utilize the internet, social media, and various other online services while we are on the move, which was made possible by the development of smartphones. Because of this, we now have access to an entire new world of possibilities and different kinds of information.

A significant number of most important applications of GSM technology are found in the healthcare sector. As a result of advancements in mobile technology, GSM has made it possible for medical professionals to virtually confer among patients and remotely check their status. Individuals who reside in rural areas or who have limited availability of medical services will find this to be of great assistance. Furthermore, the Global System for Mobile Communications (GSM) technology has played a significant role in the creation of numerous health-related applications, including fitness trackers, reminders for medications, and telemedicine services.

Banking and finance is yet another important sector that can benefit greatly from the implementation of GSM technology. Through the implementation of mobile banking, Global System for Mobile Communications (GSM) has enabled individuals to carry out a variety of financial activities utilizing mobile devices. These transactions include money transfers, payments of bills, and online purchasing. The convenience of banking has been boosted as a result of this, and it has also led to an increase in financial inclusion, especially in less developed countries where traditional banking services may not be easily accessible.

There has also been a substantial contribution made by GSM technology to the enhancement of transportation networks. Numerous cities all around the world have adopted smart traffic management systems which are based on GSM technology. These systems make use of real-time data in order to improve traffic flow and decrease congestion. There has been a reduction in air quality and carbon emissions as a result of this, in addition to making commuting more efficient. The Global System for Mobile Communications (GSM) technology has also made it feasible for humans to monitor and track cars that are used for public transportation, which has made it simpler for passengers to arrange their trips.

Another industry that has been significantly influenced by GSM technology is the educational sector. Students now have the ability to access educational assets and instructional materials on their handheld devices, thanks to the emergence of learning sites and educational apps. Because of this, education has become more accessible to individuals who might not have accessibility to conventional classrooms. Additionally, learning has become more dynamic and engaging as a result of this approach.

Within the realm of the entertainment business, the development of mobile games, video streaming services, and social networking platforms can be attributed to the implementation of GSM technology. The proliferation of these programs has not only rendered it attainable for people to enjoy entertainment

 

content whenever and wherever we want, but they have also made it feasible for artists and content creators to showcase their skills in various new ways.

## METHODOLOGY

It is clear from the name of intelligent homes that it has access to the GSM. The automation framework that functions through the GSM is referred to as the GSM framework. Similar to how Internet of Things Intelligent homes systems function, Bluetooth home automation is able to communicate with one another using Bluetooth. A home automation system that works with the GSM network to operate electrical appliances is referred to as a GSM-based intelligent home automation system.

Messages and phone calls are the means by which we exercise control over this system. It is possible to start the system through the use of calls and messages. As an illustration, the linked bulb will be turned off if we send a similar message over the GSM "light bulb off" and maintain the phrase "bulb off" inside the instructions in order to fulfill the trigger requirement. The following is an illustration of home automation using GSM and Arduino. In a manner comparable to how we may control the fan, air conditioner, light bulb, and a variety of other equipment (Figure 1).

### Component Required

- Arduino
- SIM900
- 4 channel relay
- 12V, 2A power supply for GSM module

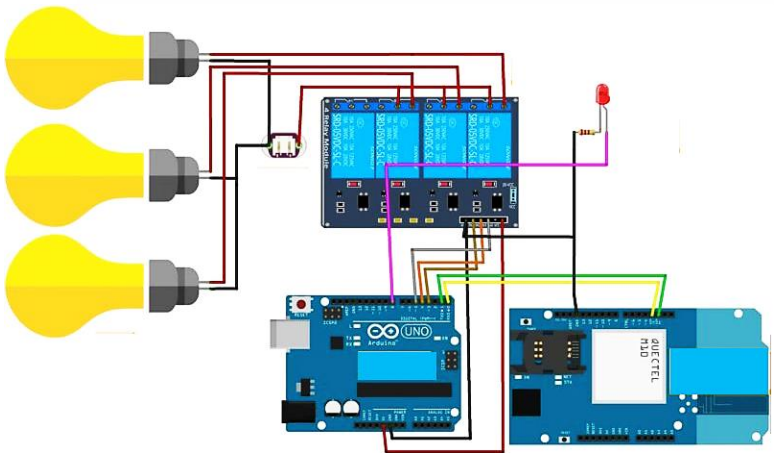

**Figure 1.** Proposed System.

## RESULTS AND DISCUSSION

- In addition, the GSM is utilized for the management of home appliances.
- Sending a quick text or making a phone call is all that is necessary to start the circuit that controls the appliances in the home.
- In the event that we deliver an alert to GSM which connects to the Arduino, the Arduino will read the message through serial connection and then compare it with the message that is stored in the database.
- The Arduino will start to implement the instruction that is attached to the condition if the first condition is true; otherwise, it will check another condition to see whether or not it is true.
- The following is a list of the several components that will be used to construct this electronic project. Additionally, it will continue to check unless the criteria is satisfied.
- It is necessary to fulfill the same condition for the call. For the GSM module to function properly, a SIM card has to be installed.

 

The Sim900 module remains my top pick when it comes to home automation programs that are based on SMS. with a power supply with 12V and 2A. Moreover Figure 2 shows the proposed circuit diagram.

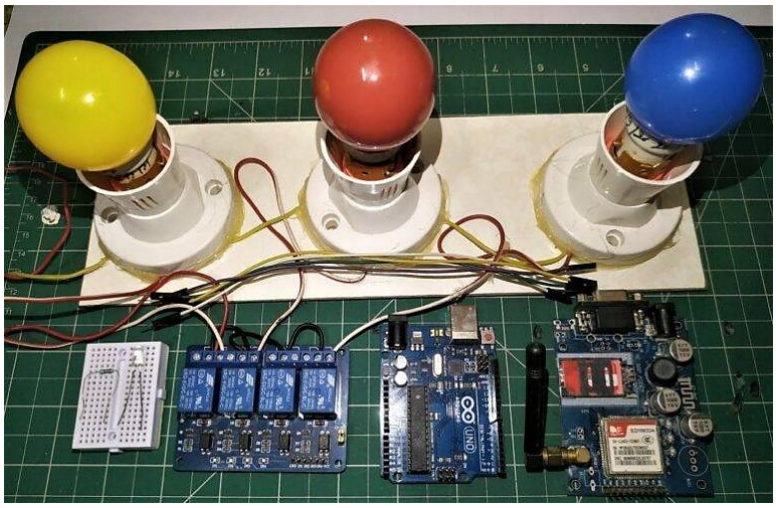

**Figure 2.** Proposed Circuit Diagram.

You will need to use the Arduino IDE program to upload the code that has been provided to the Arduino (Figure 3).

```
#define Bulb1 3
#define Bulb2 4
#define Bulb3 5
int temp=0,i=0;
int led=8;
char str[15];
void setup()
{
Serial.begin(9600);
pinMode(led, OUTPUT);
pinMode(Bulb1, OUTPUT);
pinMode(Bulb2, OUTPUT);
pinMode(Bulb3, OUTPUT);
digitalWrite(Bulb1, HIGH);
digitalWrite(Bulb2, HIGH);
digitalWrite(Bulb3, HIGH);
```

**Figure 3.** Arduino Code.

## CONCLUSION

The usage of intelligent homes system provides a multitude of advantages, including the management of household duties, energy efficiency, and ease and security within the home. Because of the rapid advancement of technology, it is quickly becoming an indispensable component of contemporary households. Our lives are not only simplified as a result of this, but our overall quality of life is also improved. If you are interested in enhancing the appearance of your home, you should think about purchasing intelligent home system so that you may take advantage of the ease and comfort that it provides. The home automation system that is based upon the use of GSM has completely changed the way that we live by making our houses more pleasant, secure, and efficient. The fact that it is simple to install and comes with a plethora of features has contributed to its rise in popularity among homeowners. For the foreseeable future, we should expect to see more creative and sophisticated home automation systems that are based on GSM. This is because technology is continuing to advance. Homeowners are

 

living in an extremely exciting time because they now have the ability to transform their residences become intelligent homes with the simple touch of a keyboard button.

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