



Gujarat Technological University



Chandkheda, Ahmedabad

Affiliated

Vishwakarma Government Engineering College

A

Project Report

On

**Automation using GSM Module**

Under Subject of

**Design Engineering-IA**

B.E. II, Semester III

EC Branch

Submitted by:

Sr. No.	Name	Enrollment No.
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**Head of the Department**

Academic year

2019-2020

## CANDIDATE'S DECLARATION

We have finished our project report entitled”**Automation using GSM Module**” and submitted to our respective guide. We are in 3<sup>rd</sup> semester and we have tried to give our best. We have done our work honestly and in a good way.

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Submitted to: Vishwakarma Government Engineering College, Ahmedabad.

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Government Engineering College A Project Report On **Automation using GSM** Under Subject  
of Design Engineering-IA B.E. II, Semester III EC Branch Submitted by: Sr. No. Name  
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(180170111121)

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## **ACKNOWLEDGEMENT**

We would like to extend our heartily thanks with a deep sense of gratitude and respect to all those who has provided us immense help and guidance during our project.

We would like to express our sincere thanks to our internal guide **(Prof. Dhara Sangani)** for providing a vision about the system and for giving us an opportunity to undertake such a great challenging and innovative work. We are grateful for the guidance, encouragement, understanding and insightful support given in the development process.

We would like to extend my gratitude to Head of Electronics and Communication Engineering Department, Vishwakarma Government college of Engineering and Technology, Ahmedabad, for his continuous encouragement and motivation.

Last but not the least we would like to mention here that we are greatly indebted to each and everybody who has been associated with our project at any stage but whose name does not find a place in this acknowledgement.

Yours Sincerely,

1	Kunal Ramchandani	180170111091
2	Divyanshu Soni	180170111108
3	Romit Srivastav	180170111110
4	Ronak Tandon	180170111113
5	Dhruv Vats	180170111121

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# **Abstract**

Mobile phone is a revolutionary invention of the century. It was primarily designed for making and receiving calls & text messages, but it has become the whole world after the Smart phone comes into the picture. In this project we are building a home automation system, where one can control the home appliances, using the simple GSM based phone, just by sending SMS through his phone. In this project, no Smart phone is needed, just the old GSM phone will work to switch ON and OFF any home electronic appliances, from anywhere.

## 1. INTRODUCTION

The circuit consists of a GSM Module and a Controller circuit. The components used in the experiment are as follows.

- Controller
- GSM Module
- Relay 5 volt
- Connecting wires
- Bread board
- 16x2 LCD
- Power supply
- Cell phone
- PDBs
- Shields
- Switches and Connectors
- Voltage Regulators

## 2. Specifications

- Power Supply: Requires a Minimum voltage of 5V and can withstand up to 18V
- Input Impedance: About 2 mega ohms
- Output impedance: About 75 ohms
- Maximum Output Current: 20mA
- Recommended Output Load: Greater than 2 kilo ohms
- Input Offset: Ranges between 2mV and 6mV
- Slew Rate: 0.5V/microsecond (It is the rate at which an Op-Amp can detect voltage changes)
- The high input impedance and very small output impedance makes IC 741 a near ideal voltage amplifier.

### **3. Circuit Description**

- Connections of this GSM based home automation circuit are quite simple, here a liquid crystal display is used for displaying status of home appliances which is directly connected to arduino in 4-bit mode.
- Data pins of LCD namely RS, EN, D4, D5, D6, D7 are connected to arduino digital pin number 6, 7, 8, 9, 10, 11. And Rx and Tx pin of GSM module is directly connected at Tx and Rx pin of Arduino respectively. And GSM module is powered by using a 12 volt adaptor. 5 volt SPDT 3 relays are used for controlling LIGHT, FAN and TV.
- And relays are connected to arduino pin number 3, 4 and 5 through relay driver ULN2003 for controlling LIGHT, FAN and TV respectively.

### **4. APPLICATIONS**

- Adds Safety Through Appliance and Lighting Control
- Saves Money and Increases Convenience
- Another home automation advantage is added safety for both your family and home. You have the ability to control the small appliances and lighting, again with the simple tap of your finger on your favorite technological device.
- Allows You Control When Out of Town
- Can be easily implemented at our homes.
- Can be used by anyone with just the knowledge of how to use application.
- Completely user controlled device.



## 5. LIMITATIONS

- The system is totally **Network Dependent**. Hence, Network Congestion can reduce the reliability of the system
- Must be kept away from children , as one single wrong touch in the application can send a wrong message to the Controller Circuit and this may results to a dangerous situation.

## 6. FUTURE SCOPES

- This project "**HOME AUTOMATION USING GSM**" is intended to automate certain functions of appliances. With the further advancement of technologies and communication sector new development can be done in this project.
- This will make possible for wireless technologies to soon be accessed at low cost and economically affordable prices.
- The device is very useful in controlling electronic appliances using **IOT** and reduce the wastwge of energy and time.

## **Empathy canvas**

To define any user's centric problem we need to know the user properly. That was what this canvas was all about.

We thought about so many people but wanted to go for some people that mostly remain untouched by technology but are larger in number.

They cover a large mass but are least touched with technology.

## Story boarding

Most interesting part was the 'Story Boards' which can be called the board of emotion understanding the problem of society is one of the biggest challenges for engineering student as till now they were making projects on imaginary ideas.

It helped us understanding that when we build anything for anyone, the purpose and emotion behind that are equally important.

**Design For** HOME AUTOMATION

**Date**

**Design By**

**Version 1.0**

ROME SENTENCING  
 DIVISION SOLE  
 COURT STAFF  
 COURT REPORTER  
 COURT CLERK  
 COURT REPORTER  
 COURT CLERK

USER	STAKEHOLDERS	ACTIVITIES
<div style="display: flex; justify-content: space-around;"> <div style="background-color: #90EE90; padding: 5px;">Smartwatch</div> <div style="background-color: #FFFFE0; padding: 5px;">Latching</div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="background-color: #FFDAB9; padding: 5px;">(IT) Engineers</div> <div style="background-color: #90EE90; padding: 5px;">(EE) Engineers</div> <div style="background-color: #FFB6C1; padding: 5px;">Cool body</div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="background-color: #FFDAB9; padding: 5px;">Backs</div> <div style="background-color: #FFB6C1; padding: 5px;">Holds</div> </div>
<div style="display: flex; justify-content: space-around;"> <div style="background-color: #FFDAB9; padding: 5px;">Communication</div> <div style="background-color: #FFDAB9; padding: 5px;">Programming</div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="background-color: #FFDAB9; padding: 5px;">Controlling</div> <div style="background-color: #FFDAB9; padding: 5px;">Designing</div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="background-color: #FFDAB9; padding: 5px;">Solving</div> <div style="background-color: #FFDAB9; padding: 5px;">Testing</div> </div>
<div style="background-color: #FFDAB9; padding: 5px;">Strenuous</div>	<div style="background-color: #FFDAB9; padding: 5px;">Processing</div>	<div style="background-color: #FFDAB9; padding: 5px;">Automation</div>

**STORY BOARDING**

**HAPPY:-**  
 I was in a hurry for my work so immediately I have to go and then suddenly a notification drop in my phone that my gyron and AC were still on and then after I used gym IS-95 application to shut the device OFF without any disturbance with ease.

**HAPPY:-**  
 A patient is discharged from the hospital and thanks of taking rest at his home, but still has to go to the hospital for regular checkups. He may have a mobile phone and also some medical sensor device like health monitoring device, which can really help him for the checkups without going to the hospital and by saving much of time and money.

**SAD:-**  
 While I was driving to home late night and was very tired from work so I thought of sleeping on the AC, so that when I reach my home I can easily sleep without any headache, but after arriving the home, I saw that the AC was OFF and made me feel tired and due to some signal issue AC doesn't start.

**SAD:-**  
 1) Interferes with some electronics especially when audio applications.  
 2) Intellectual property is concentrated among a few industry participants, creating barriers to entry for new entrants and thereby  
 3) There is a fixed maximum all the range of factors, which is imposed by technical limitations.  
 4) High complexity of the system.

## AEIOU Canvas

Activity Canvas was the portion, in which we had to include the activities that people carry out in their life. We tried to note down all the security and safety activities that goes on in the background.

**AEIOU SUMMARY**

GROUP ID : 187711

DATE :

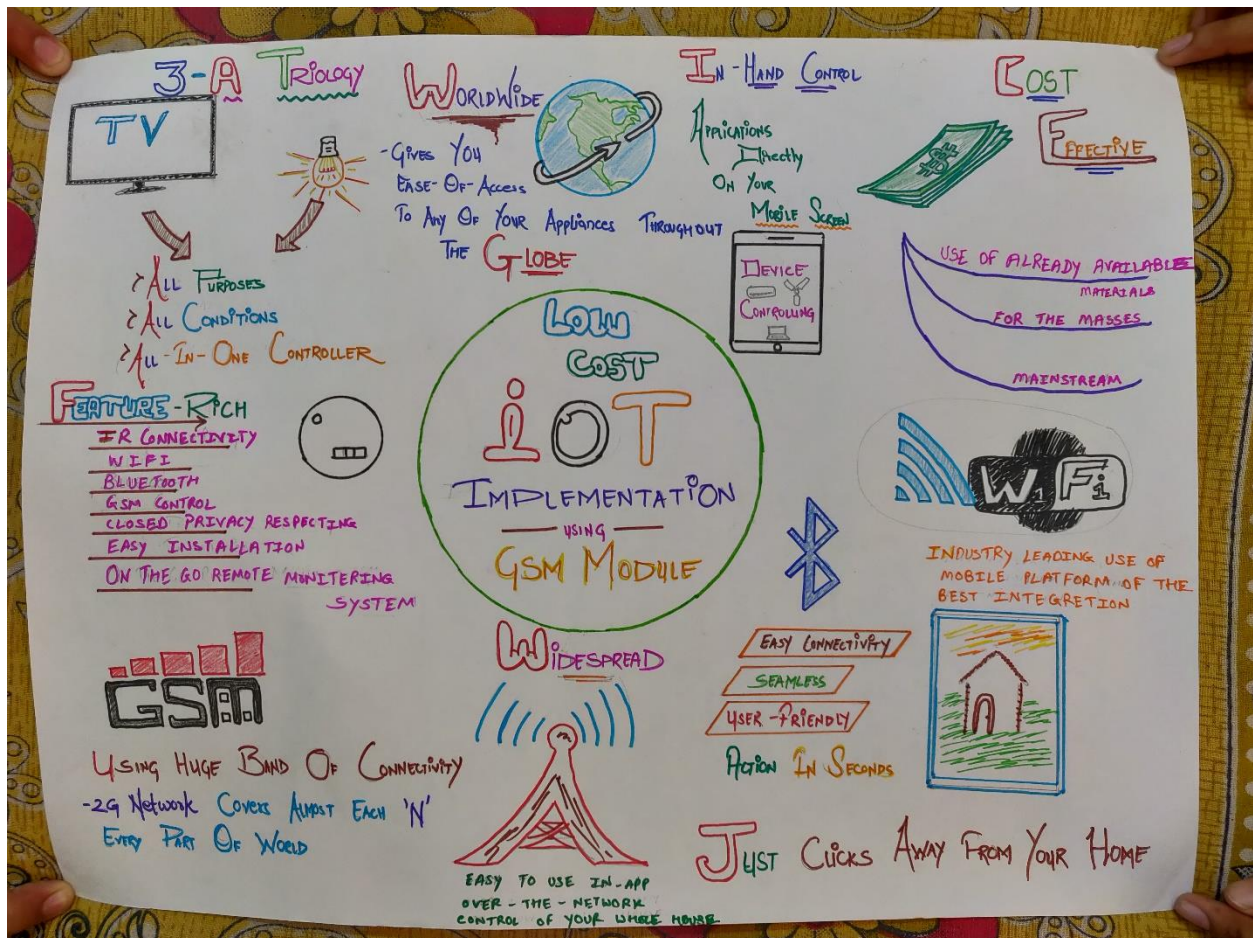
DOMAIN NAME : IOT

Activity:	Environment :	Interaction :
Run	Rainfall	Society
Run	Energy Run	Electronic
Run	Night	Sellers
Run	Summer	Government
Run	Winter	Housewives
Run	Rainy	Consumers
Run	Day	Leaders
Run	Helpful	Students
Run	Energy Run	Engineers
Run		Builder
Run		Researcher
Run		Teachers

Objects :	Users:
Run	Enter
Run	Wanda
Run	Hospital
Run	Museum
Run	Shed
Run	School
Run	Bank
Run	College
Run	Business
Run	Warehouse
Run	Lake
Run	Research Center
Run	Home
Run	Company
Run	Housewife
Run	Society

## Mind map

This canvas is summarization canvas for all the other canvases we used during the designing process. We included users in our canvas users are the persons who use this application or who are connected with this sector. Also we include problems and solutions in this canvas. This canvas is very useful to develop application.





## Ideation Canvas

In ideation canvas we started with people. people includes that who can be connected with our project. There are various people who are connected with our project like people with hand disability, Medical sector, Automation systems Then we listed out that what activity every segment of people does. Then we thought about situation/context/location and finally for possible solutions.

The Ideonaut: Ideation Canvas

Project: IoT Implementation using GSM

Team: 187711

**People**

Jobs: Scientist, Farmer, Bank, Engineer, Telecom, Museum

Activities: Artist, Housewife, Doctor, Organizer, Communities

**Activities**

Screen, Data log, Solenoid, Infrared, Control, Test, Design, Command

**Situation / Context / Location**

Makes data transfer quickly, House, Office, Reduces human efforts, Environment friendly, Compact size

**Props / Possible Solutions**

Biological, High Speed Data Transfer, Satellite based Communication

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# Product Development Canvas

In this canvas we mentioned purpose of our product, functions, features and products experience.

For this purpose, we defined some functions that our product must do. These included, for each of the function that our product fulfills, also there is some features of our product.

The components which are required for our product is also mentioned.

Product Development Canvas		Team/ Date/Version: ID: 187311 / / 1.0
<b>① Purpose</b> <small>What is the purpose of this concept you're developing? Does it solve a problem, or it enhance a certain experience? Is it serving a need as it is trying to create a new need or tap an untapped need?</small> <ul style="list-style-type: none"> <li>HOME AUTOMATION USING GSM IS USED TO CONTROL HOME APPLIANCES REMOTELY.</li> <li>WITH THE USE OF COMPUTER AND ELECTRONICS TECHNOLOGY ELECTRICAL APPLIANCES CAN BE CONTROLLED FROM ANY PART OF WORLD.</li> <li>CONSEQUENTLY, GREATER AMOUNT OF ENERGY WILL BE SAVED AND HENCE THE NATURAL RESOURCES.</li> </ul>	<b>👑 Product Experience</b> <small>Can we what your customer should feel like when he uses your product/service? What emotions/feelings would define his experience? Feeling of comfort, convenience or feeling of being in sync with natural resources or feeling of greater accuracy/precision etc.</small> <p>CUSTOMER WILL FEEL CONVENIENCE BY BUYING THIS PRODUCT AS IT WILL REDUCE THE TIME OF DATA TRANSFER THEY WILL FEEL COMFORT AND RELIEVED.</p>	<b>📋 Customer Revalidation</b> <small>Once you're aligned with your features and test with the customer based on the features, functions are useful. Repeat to the customer how the features, functions are useful. Repeat to the customer how the features, functions are useful.</small> <p>AS BPO WEATHER AFFECTS GSM COMMUNICATION LONG RANGE SIGNAL PROCESSING IS ALSO AFFECTED GREATLY SO WE CAN DO FREQUENCY MODULATION AND CHANGES IN CARRIER WAVE TO MAKE LONG RANGE SIGNALS AND COMMUNICATION POSSIBLE.</p>
	<b>🔧 Product Functions</b> <small>Functions are a products answer to user problems/needs. They do something that user wants. They are often verbs in nature. Every function is powered by many features. Multitasking is a function. Browser tabs is a feature that powers the multitasking feature. A function can have one or more features powering it. Functions are very generic in nature. Features are often more specific. Features can be similar to product experience. Safety (product function) provides a feeling of safety (product experience).</small> <p>HOME AUTOMATION USING GSM MODULE POWERS CONTROLLING OF VARIOUS ELECTRONIC DEVICES AT A PARTICULAR TIME WHICH MAKES IT USER FRIENDLY AND ALSO CONSUMES LESS ENERGY ALSO SAVES ENERGY.</p>	
	<b>📦 Product Features</b> <small>Product features are specific. One or more features will power a function. Airlock Brakes. Airbags are features that power the safety function. Browser tabs, Apple's Home button is multitasking between apps are features powering the multitasking function. Don't test we will have many components powering it. Sometimes a very popular component becomes a feature itself. Like car seats is a major component and a feature of the automobile. Powering the in car entertainment system providing entertainment as a product experience.</small> <p>THE BENEFITS OF AN AUTOMATION SYSTEM IS ITS ABILITY TO THE DIVERSE ELECTRONIC DEVICES TOGETHER SO THEY CAN PERFORM AS ONE UNIFIED SYSTEM. AUTOMATION IS ALL ABOUT BEING ABLE TO CONTROL THINGS IN YOUR HOME. THERE ARE A NUMBER OF DIFFERENT WAYS YOU CAN CONTROL THE ELECTRONIC SYSTEMS IN YOUR HOME BY PRESSING THE BUTTONS OF HANDHELD REMOTE OR WALL MOUNTED KEYPAD.</p>	
<b>👤 People</b> <small>Who is the key customer segment who will use this product/service or the end product of the concept you're pursuing? Write here about them, describe them a little.</small> <ul style="list-style-type: none"> <li>COMMON HOUSEHOLD PEOPLE AS EVERYTHING WILL BE CONTROLLED USING SMARTPHONE, THE LIFE OF COMMON PEOPLE BECOMES EASY AND DIGITAL AS WELL AS SMART.</li> <li>FACTORIES THIS PROJECT CAN BE USED IN FACTORIES AS WELL WHICH MAKES FACTORY HANDLING AND MAINTENANCE EASY AND TRASSIE FREE.</li> </ul>	<b>⚙️ Components</b> <small>Components build up the features. For a car it will comprise a set of components like the body, engine, etc. that go into making it. For a laptop browser it will comprise of various chunks of code that will make the tabs work. In cases where the feature is a major component, you could list them the auxiliary components that are required to make the major component work. You can also list new adjustments and innovations you're planning here at the component level.</small> <div style="display: flex; flex-wrap: wrap;"> <div style="margin: 5px;">RE</div> <div style="margin: 5px;">BUZ</div> <div style="margin: 5px;">REUSE</div> <div style="margin: 5px;">LCD</div> <div style="margin: 5px;">IR S/N</div> <div style="margin: 5px;">GSM</div> <div style="margin: 5px;">SIM</div> <div style="margin: 5px;">LEDs</div> <div style="margin: 5px;">ARDU</div> </div>	<b>🧪 Reject, Redesign, Retain</b> <small>Post customer validation, reject, those functions or features that the customers didn't find useful. Redesign those that were partially useful and retain those that the customers loved with this until all functions/features are accepted.</small> <ul style="list-style-type: none"> <li>USING HOME AUTOMATION SYSTEM USING GSM IT IS EASY TO CUSTOMISE HOME AUTOMATION SYSTEM TO FIT YOUR NEEDS.</li> <li>EARLIER WE DEVELOPED AN APP BUT THERE WERE LOTS OF BUGS WHICH AFTER CUSTOMER REVIEWS AND LOTS OF TESTING WE REGULARLY UPDATED OUR APP.</li> </ul>

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## **Conclusion**

The main purpose of the project is to provide a smart and efficient way to control the electronic devices with the help of modern communication technologies. With the use of Controllers and Modules this is not only the approach towards the next generation homes but also very friendly and easy to use system. This project will give our daily life a new dimension and also helps to save energy.



