**PORTABLE IOT BOARD**

**PROJECT SYNOPSIS**

***Submitted in partial fulfillment for the award of degree***

**Of**

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**IN**

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**INDEX**

1. ABSTRACT
2. INTRODUCTION
3. LITERATURE REVIEW
4. PROPOSED METHODOLOGY
5. DIVISION OF WORK
6. REFRENCES
7. **ABSTRACT**

It is a height of paradox in a country like INDIA where blackouts are more a norm than exception. Billions of unit of electricity are being wasted every month. The only remedy to improvise the conundrum is to begin from the primitive level. i.e. From our homes.

Homeautomation can help us in saving energy by ensuring our home uses electricity more effectively, reducing waste throughout the home. However, home automation systems have struggled to become mainstream, in part due to their technical nature. A drawback of smart homes is their perceived complexity; some people have difficulty with technology or will give up on it with the first annoyance. Smart home manufacturers and alliances are working on reducing complexity and improving the user experience to make it enjoyable and beneficial for users of all types and technical levels.

According to a Market Research done by RedSeer, the home automation market in India is expected to reach around INR 8000 crores by end of 2018.

So, our Team suggests an “IOT based home automation project”, which will be a boon in upcoming future for the mankind.

1. **INTRODUCTION**

We live in an era where more and more items “things” are becoming smarter day by day. “Things” have sensors and can communicate to other “things” and can provide control to more “things”. With advancement of Automation technology, life is getting simpler and easier in all aspects. In today’s world Automatic systems are being preferred over manual systems. With the rapid increase in the number of users of internet over the past decade, we have made Internet a part of our daily life. IOT (Internet of Things) is the latest and emerging internet technology. IOT is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities.

The theme of our minor project is IOT based home automation. The basic idea behind it is just to make it easier for the people to control the home appliances from far distant places as well. We are doing it by using ESP8266 Wi-Fi Module, Arduino, Relay circuits and a few simple components. We can control two electrical devices using an Smart Phone. In Minor Project we will be able to make the ON/OFF mechanism successfully possible. We propose and believe to do further obscure technical amendments in Major Project in due course of time.

**Portable IOT Board** is a system that uses smart phones to control basic home functions and features through internet from anywhere around the world, an automated home is often called a smart home. It differs from its counterpart products manufactured by other companies, as it is portable, and cheaper in cost too i.e. if a consumer buys this product, it can be handy and easy to install anywhere. It is meant to save the electric power and human energy.

1. **LITERATURE REVIEW**

IoT based home automation is subject undergoing intense study. If we see IoT in its technical aspect and market outlook, it is still in its early stages. We have gone through some previous research work and market analysis in product form, related to our project.

We read a lot many research papers and extracted valuable assets for our project.

Kumar Mandula, Ramu Parupalli, CH.A.S.Murty, E.Magesh, Rutul Lunagariya {1}, have successfully shown the usage of an android app to control home lightening system. They basically took two prototypes namely Horne automation using Bluetooth in an indoor environment and Horne automation using Ethernet in an outdoor environment are presented.

Andi Adriansyah and Akhmad Wahyu Dani{2} illustrated to offer a Small Smart Home System designed and created by utilizing WLAN network based on Arduino microcontroller.

Shweta Singh, Kishore Kumar Ray{3} explained the overview of Internet of Things, architectures, and vital technologies and their usages in our daily life

Vahid Hassanpour, Sedighe Rajabi, Zeinab Shayan, Zahra Hafezi, Mohammad Mehdi Arefi {4} gave the idea for cost reduction of iot based home automation in product form.

After going through some market analysis we can infer some mind boggling facts.

According to the new market research report, "Home Automation System Market by Protocol and Technology (Network and Wireless), Product (Lighting, Security and Access Control, HVAC and Entertainment Control), Software and Algorithm (Behavioural and Proactive), and Geography - Global Forecast to 2022," the home automation system market was valued at USD 39.93 billion in 2016 and is expected to reach USD 79.57 billion by 2022, at a CAGR of 11.3% during the forecast period. {5}

India Home Automation Market - Expected to Cross INR 30,000 Crore by 2022 - Research and Markets{6}

Pune is the biggest market for home automation in India as it accounts for the 15% of the total market share.{7}

The residential segment accounts for nearly 60% of India’s home automation industry (out of which individual homes and villas account for 75-80% of market and builders account for 20% of market). This segment has the highest growth and is currently growing at a CAGR of 35-40%. The market for residential home automation is highly fragmented, especially in home security systems.

Commercial spaces contribute to 30% of the home automation market. This segment is largely driven by security and access systems. Large companies like Samsung, Bosch and Honeywell dominate this segment in India. Efficient building management systems are fast gaining popularity in India as well.

The hospitality industry also uses home automation and accounts for 10% of the market. Security and lighting systems are popular in this sector due to the growing need for differentiation. {8}

1. **PROPOSED METHODOLOGY**

**Phase I**

* Initiation
* Literature Research
* Market Research
* Study of components
* Working with components and rough framework
* Testing and debugging of Wi-Fi module using AT commands

**Phase II**

* Introduction to Blynk app Installing its libraries to Arduino IDE
* Make simple model in Blynk app and operate
* Sending data of Blynk app to its Server using WiFi.

**Phase III**

* Receiving data through Blynk
* Upload IDE code into Arduino and make proper connection of circuit diagram

**Phase IV**

* Testing and debugging
* Observe results

1. **DIVISION OF WORK**

**HARDWARE CONNECTION**

Work Allotted: Sumesh Kumar

**CODING**

The coding will be done for the Arduino board. The Arduino board is a multipurpose microcontroller board based on the AT mega 328. It has 14 digital I/O pins, out of which 6 can be used in PWM mode. It has 6 analog pins with internal ADC available already, a 16MHz crystal oscillator, a USB connection, a power jack and a reset button. It operates on a rated voltage of 5V.The Arduino IDE which can be downloaded from the net free of cost is used for the development of the code. A serial interface is also provided in it to allow serial data transmission.

Work Allotted: Ragesh Jaiswal

**MARKET ANALYSIS and DOCUMENTATION**

The Market Analysis will be done by going through the Annual Reports and Tech articles associated to the companies like Apple, Honeywell International Inc., Siemens AG, Zigbee Alliance, Johnson Controls Inc. etc.

Work Allotted: Nitin

The steps envisioned are as follows:

First would be the study of the components and how they should be programmed to work for this project. The requirement of components/spare parts will be taken care of by performing theoretical calculations. Since the GSM module which will be used would be a new device, a bit more effort would be needed to study and learn to code it so as to send signals through the device to a mobile as well as receive signals from the phone to control the Arduino board through GSM communication.

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