EASWARI ENGINEERING COLLEGE

(Autonomous)

An Internship Report on

" IOT APPLICATIONS USING RASPBERRY PI "

Submitted in Partial Fulfilment of for the award of degree of

BACHELOR OF ENGINEERING

in

ELECTRONICS AND COMMUNICATION ENGINEERING

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CERTIFICATE

Certified that the internship work entitled " IOT APPLICATIONS USING RASPBERRY PI **"** is a bonafide work carried out by AJITHKUMAR .P.R **(310621106009)** of Easwari Engineering College, Chennai, and this report is submitted in partial fulfilment of the award of **Bachelor of Engineering in Electronics and Communication Engineering of Easwari Engineering College, Chennai,** during the year
2023-2024.

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Designation   Designation

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Internal Viva

Name of the Examiners   Signature of the Examiner

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ABSTRACT:

Internet of things is the present technology that permits us to control hardware via the internet. Using IOT system, we can link the physical devices and possess the ability to send or transfer data over a network with either human to-human or human-to-system interaction. This paper explains how to control.

The home appliances using Internet of Things. The microcontroller we are using for this project is Raspberry Pi. The Raspberry Pi is interfaced with Wi-Fi modem. for transmitting and receiving commands over the internet. To switch loads, we are using relays. Once the user passes instructions over the internet to switch on the appliance, the raspberry pi processes these commands and operates accordingly. Liquid Crystal Display is used to display the status of the system.

Hence, IOT based home automation setup allows us to control home.

COMPANY PROFILE:

National Small Industries Corporation (NSIC) is an certified Government of India Enterprise under Ministry of Micro, Small and Medium Enterprises (MSME). NSIC has been working to promote, aid and foster the growth of micro, small and medium enterprises in the country. NSIC operates through countrywide network of offices and Technical Centers in the Country. In addition, NSIC has set up Training cum Incubation Centre managed by professional manpower.

Marketing Intelligence:

Collect and disseminate both domestic as well as international marketing intelligence for the benefit of MSMEs. This cell, in addition to spreading awareness about various programmes / schemes for MSMEs, will specifically maintain database and disseminate information.

Technology Support:

Technology is the key to enhancing a company's competitive advantage in today's dynamic information age. Small enterprises need to develop and implement a technology strategy in addition to financial, marketing and operational strategies and adopt the one that helps integrate their operations with their environment, customers and suppliers.

NSIC offers small enterprises the following support services through its Technical Services Centres and Extension Centres:

1. Advise on application of new techniques
2. Material testing facilities through accredited laboratories
3. Product design including CAD
4. Common facility support in machining, EDM, CNC, etc.

5. Energy and environment services at selected centres

International Consultancy Services:

For the last five decades, NSIC has acquired various skill sets in the development process of small enterprises. The inherent skills are being networked to offer consultancy services for other developing countries. The areas of consultancy are as listed below:

- ♦ Capacity Building`
- ♦ Policy & Institutional Framework
- ♦ Entrepreneurship Development
- ♦ Business Development Services

What is Internet of Things?

The Internet of Things (IoT) is a scenario in which objects, animals or people are provided with single identifiers and the capability to automatically transfer and the capability to automatically transfer data more to a network without requiring human-to-human or human to-computer communication. IOT has evolved from the meeting of wireless.
technologies, micro-electromechanical systems (MEMS) and the internet.
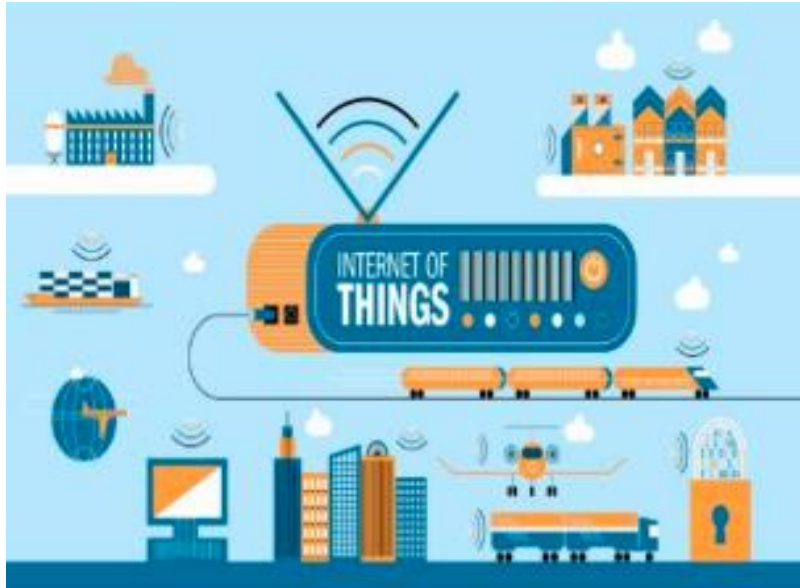
IOT Design Methodology:

All web application is developed natively in Java Programming Language. It includes java technologies similar to JSP, servlet's, hibernate, and web services etc., latest version of net beans IDE is basically used for web applications development. Additional technologies like bootstrap, java script, jQuery etc are used to handle UI and client-side validations. Cisco provided APIs are used to develop application related to Cisco IP phones. Five steps are used in web applications.

- Installing Apache Web server
- Create My SQL database system.
- Developed web application Programs for the Web Application
- Host Web application on our Web server

Raspberry Pi

Raspberry pi is a small microcontroller almost a size of a credit card. In other words, it is a tiny computer on a single board. It is especially designed for students interested in electronics and

programming. It is a very cheap computer, but it also provides a set of General-Purpose Input Output pins that allow use to control electronic components for physical computing and explore the Internet of Things.

The power consumption by raspberry pi is very less compared to that of a regular computer. It can be effortlessly linked to other peripherals and other circuit boards. It operates on open-source software and gives students the potential to try any software according to their application. It is a single circuit board and has different ports for USB, HDMI, analog audio, power composite video, internet, SD Card. There are many. generations of Raspberry Pi: - Pi 1, Pi 2, Pi 3 and Pi4, and there have in general been a Model A and a Model B for most generations.

SYSTEM DESIGN AND IMPLEMENTATION:

Hardware Specifications are- Raspberry Pi, Wi-Fi, Relays, Capacitors, Resistors, Diodes, LCD Display, lights, fan, Relay Driver IC. The circuit consists ofraspberry pi which is used to control 4 loads, that is 3 lights and 1 fan. Liquid Crystal Display is used to display the status of the system. Power supply is used to supply power to the setup. Step down transformer, rectifier and regulator are used to regulate 5V DC, as relays are designed to run on a particular voltage from 5V/12V DC. Relay has 3 terminals- NO, NC and COM. It is an electromagnetic circuit and the 2 configurations in general of relays are- Normally close (NC) and normally open (NO).
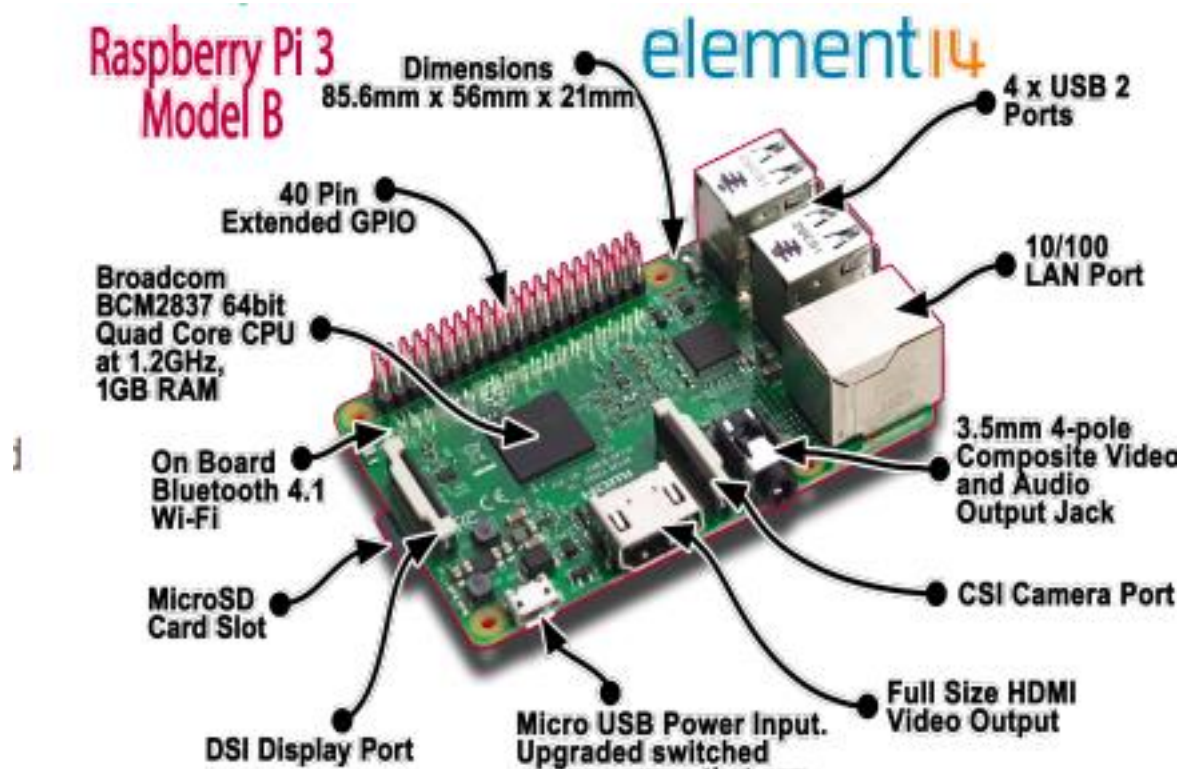
APPLICATIONS

Raspberry Pi's main aim is to fascinate people towards computing and programming and even to solve their complex mathematical problems. Some of the applications are mentioned below.

- Home Automation System: The system can easily host some of the home automation applications with the interfacing of relays, sensors and lights with smartphones or computers. The operator can easily operate the system remotely.

- Zero-Powered Smartphone: The developer/engineer can easily develop a homemade smartphone by assembling various. electrical parts that are easily available within the vicinity.

- AI Assistant: It enables the user to easily integrate common language voice commands viaGoogle Assistant SDK as well as Google's Cloud Speech API.

- Motion Capture Security Camera: Raspberry Pi Camera module can get easily connected to a generic USB webcam to develop a motion capture security system.

- Live bots: Live bot is a system that enables the user to handle/control many robots based on Pi

over the internet

Raspberry Pi 3 Model B

Dimensions 85.6mm x 56mm x 21mm

element14

4 x USB 2 Ports

40 Pin Extended GPIO

10/100 LAN Port

Broadcom BCM2837 64bit Quad Core CPU at 1.2GHz, 1GB RAM

On Board Bluetooth 4.1 Wi-Fi

3.5mm 4-pole Composite Video and Audio Output Jack

MicroSD Card Slot

CSI Camera Port

DSI Display Port

Micro USB Power Input. Upgraded switched

Full Size HDMI Video Output

CONCLUSIONS

1. Number of users supports the fact that the device needs some improvement in terms of availability of internal storage and integration heat sink which will further enhance the efficiency of the product.

2. By providing an external case and an appropriate User guide will further boost the product demand across the globe.

3. To run a full version of Windows directly over Raspberry Pi, it requires GPU unit, and if that is integrated with the device, then Pi will be on a whole new level.

4. The combination of embedded systems and traditional computer features makes Raspberry Pi a perfect board for interfacing a wide range of external peripherals.

5. The programming of General-Purpose Input/Output (GPIO) pin is very simple when compared to traditional microprocessor or FPGA.

6. Enhanced flexibility and endless possibility of Raspberry Pi, enables the end-user to program it according to their needs and budget.

7. Lastly, Raspberry Pi can be used as an individual computer but cannot replace the traditional computer, owing to its specific

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