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Android Operated Application Based Smart Eye for Home Automation System Using Open Source Android Application

Yashodeep Patil[1] | Prof S. P. Dhanure[2]

[1, 2] Department of E&TC, SITS, Narhe, Pune, Maharashtra, India.

ABSTRACT

`In recent years, the number of network enabled digital devices and services at homes has been increasing fast. With the rapid increase of the Internet, the owners have been requesting remote control and monitoring of these in-home appliances. This application leads to networking these appliances to form a kind of home automation system. In this paper, an Android based home automation system that allows multiple users to control the appliances by an Android application developed as well as using a web server is created. The system used has three hardware components: raspberry pi a local connected device to transfer signals to home appliances, a Web server to store customer records and support services to the other components, and a smart mobile phone smart device running Android application developed. Distributed cloud platforms systems and services of Google are used to support messaging between the components. The prototype implementation of the proposed system is evaluated based on the criteria considered after the requirement analysis for an adequate home automation system. The aim of this paper is to define the research of home automation systems using android application, to provide home automation system using android application operation also by creating a web server connected to ARM 7 board and Raspberry Pi 2.

KEYWORDS: *Wi-Fi, Router, Wireless Communication, Web server, ARM 7 BOARD*

I. INTRODUCTION

Now a days Internet of Things is a mostly used concept in which the devices or things are made to interact with the environment by exchanging data and information sensed by the sensors. The devices gather information and data from the surrounding environment by using various latest technologies and then there is a data flow between devices. Typically, IoT offers advanced connectivity of devices, systems, and services which is beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices will used in automation in nearly all fields, right from a Smart Grid, to the areas such as home automation as well as smart cities. IoT is a concept which is expected to rule the world within a few years.

Android is mobile operating system(OS) currently developed by Google .based on the linex kernal and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed android TV televisions, Android auto for cars, and Android wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics. As of 2015, Android has the largest installed based of all operating systems.

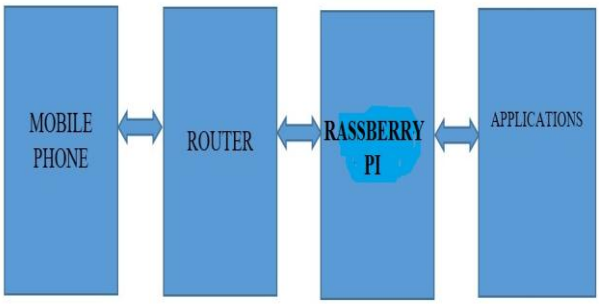
ARM-7 Development Board

LPC2148 Development Board is a powerful development platform based on LPC2148 ARM7TDMI microcontroller with 512K on-chip memory. It is ideal for developing embedded applications involving high speed wireless communication (Zigbee / Bluetooth / WiFi), USB based data logging, real time data monitoring and

control, interactive control panels etc. The onchip USB controller provides direct high speed interface to a PC/laptop with speeds up to 12Mb/s. The USART boot loader eliminates need of an additional programmer and allows you to program using serial port. The on board peripherals include Micro-SD memory card interface, USB2.0 interface, 4KB I2C EEPROM, Xbee / Bluetooth / WiFi wireless module interface, 16x2 character LCD, 256x64 GLCD and many more. The on-chip peripherals and the external hardware on the development board are interconnected using pin headers and jumpers. Direct access to I/O pins enables you to connect your own devices very easily to the processor. The board is made from double sided PTH PCB board to provide extra strength to the connector joints for increased reliability.

II. SYSTEM IMPLEMENTATION

IoT is a Home Automation is a kind of containing building automation. Home automation mainly reduces the human efforts and enhances the facility of our home with improved convenience, ease and security. It also adds smartness to the machine learning ideas. Home Automation is becoming popular as the concept of "Internet of things" has paired with it. With the help of internet of things, home automation control controls the home appliances such as control of lighting, air conditioning, heating, home theatre, electric doors and other electronic appliances. Electrical devices of home are combined with each other in home automation system. These devices are connected through a home network to allow control by a Smartphone or tablet with internet access. Through the involvement of information technologies, the home appliances can operate smartly with the help of internet of things which results in convenience, ease, power efficiency, and safety. Also in industrialization, the automation system proves itself a highly intelligence. In this paper we introduce Internet of Things based Home Automation System which provides a low cost, user friendly, smart home. It uses an Android application which provides Switching functionalities, where the Electrical/Electronic appliances can be monitored and controlled remotely. This System eliminates use of traditional personal computers (PC) and its peripheral devices, which provides easy mobility concept which is expected to rule the world within a few years. Below figure shows block diagram for the system.



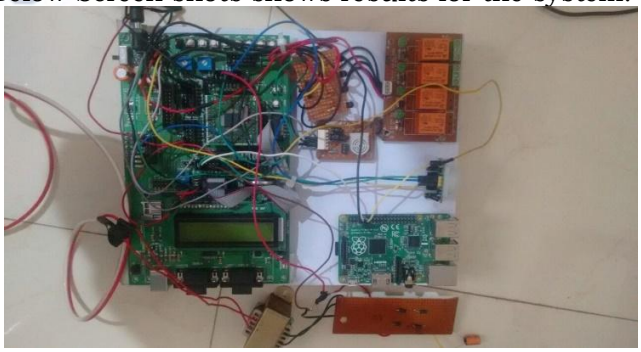
III. EXPERIMENTAL SETUP

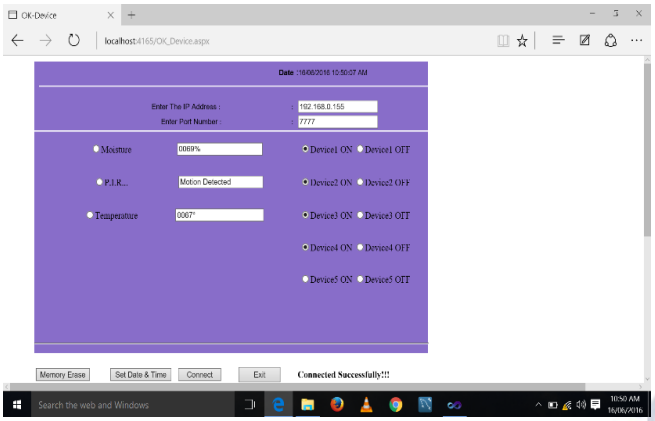
First of all we have to install Raspbian os on memory card Raspbian is a Debian based free operating system designed specially for the Raspberry Pi hardware.The Raspbian distribution freely available from the Raspberry Pi downloads page.

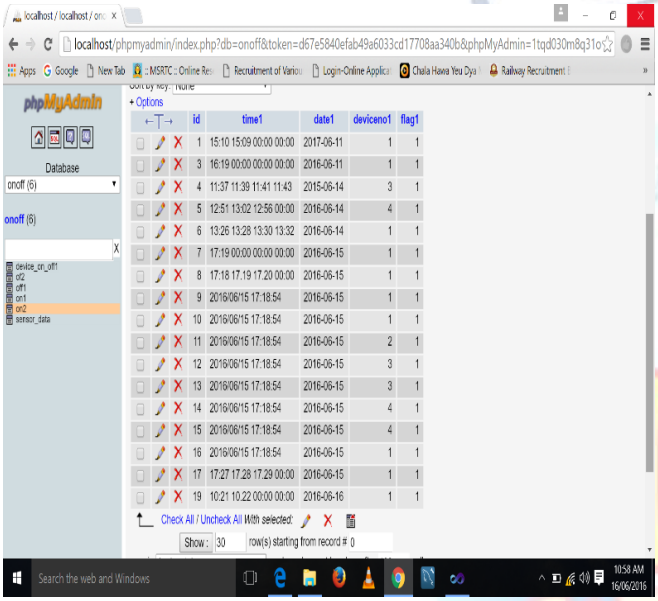
- Download Raspbian image from http://www.raspberrypi.org/downloads.The image file is *2014- 01-07wheezy-raspbian.zip* and unzip the same *$ unzip 2014-01-07wheezy-raspbian.zip* into current directory.
- Install image writer software on ubuntu using below command.
- *$ sudoapt- get install usb- image writer.*
- Plug SD card in SD card-reader and connect it to computer.
- Launch Image writer using command *$ sudo imagewriter.*
- Image writer will get launched .
- Select Raspbian image in Write image and SD card drive in to.
- Click on write to disk.
- Writing image file to SD card.
- Click on write to disk.
- Writing image file to SD card.
- After finishing remove SD card and connect it to pi board and follow process to access it on pc using ssh.

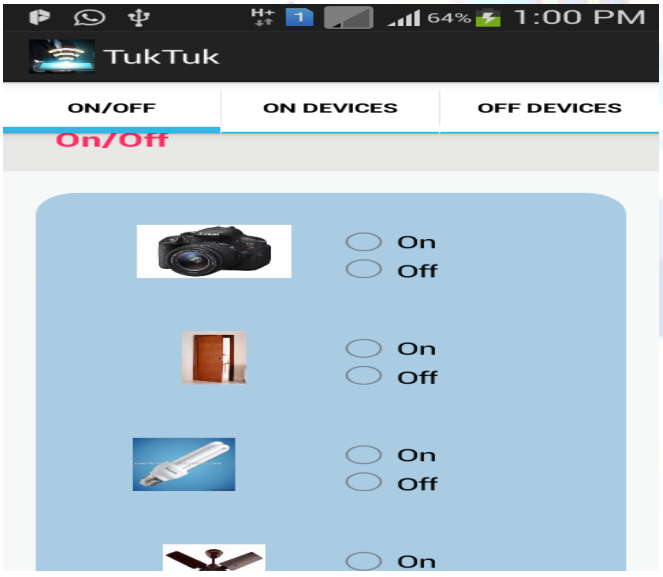
IV. RESULTS

Below Screen shots shows results for the system.









V. CONCLUSION

This system can be used to monitor and control the various applications in home automation as well as industrial applications through android application developed named “Tuk Tuk”.

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