

# A Review on Design and Implementation of TCP/IP web server on Raspberry Pi

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**Abstract-**As internet enabled devices like smart phones are developing widely which needs to acquire and control data, so the design challenges are adding more functionality and cost reduction. This paper introduces methodology for developing embedded web server system that can remotely acquire and control data which uses SOC platform.

This paper uses hardware as Raspberry and TCP/IP.

**Key words:** Raspberry, Tcp/Ip.

## I. INTRODUCTION

Focusing on the autonomy of the people over the age of 65 having the disabilities, this paper represents a web server to monitor and control data in home area network. Now a day's internet enabled devices are becoming very popular, on the same technology we are going to implement TCP/IP web server system which acquires and monitors the data and provides control over the devices [1].

Needs of high speed, bandwidth, economy, compatibility, are satisfied by the Web server system using TCP/IP. For this, interface design is the main issue, web pages provide the interface to the embedded server system. HTML (hypertext-markup-language) pages and web server software is the need of embedded system [1].

At the front end we can use HTML page for use interface which provides connectivity. The webpages are files or blocks of text that use a form of encoding called hypertext markup language (HTML). The HTML encoding specifies the formatting of text and images on the page, including text size and fonts and the positioning of text and other elements on the page. The HTML code may include links to images that appear on the page, as well as links to other pages or resources. In serving a webpage with dynamic content, the software must have a way of inserting the dynamic content as the page is being served.

TCP/IP allows the different computing devices to access the web page which provides greater security, the user can browse web page from different area using the home area network/internet .

The purposed system provides control over,

- Control of home appliances.
- Measuring of sensors data
- Monitoring of live status of devices.

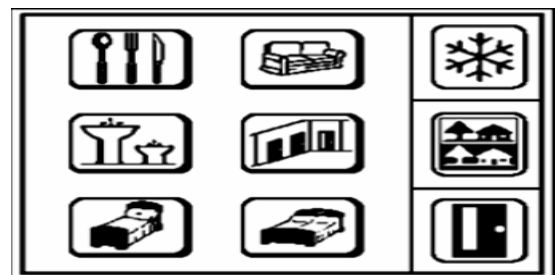
## II .RELATED WORK

It is noticed that, works on home automation for people disabilities are specific, usually on single type. This wok focuses on elderlies, visually impaired people, hearing impaired, people with motor impairment & cognitive disabilities [2].

The project assistive housing focuses on elderly comfort uses television set and remote for home automation. To improve legibility& accessibility large icons along with captions were used. In that numbers are used as a shortcuts to interact with user & navigation is avoided [2]&[8]. There are also two projects but that doesn't represent any interface design [3] & [4].

Another paper provides solution for upper and lower limbs by combining touch screen and voice control [5]. Also a gesture based home automation system was developed [6].

[7] In Mainardi's work, the project is designed for people with manual dexterity and mobility impairments, but it could be widely used. The idea is to have a portable touchscreen device with the proposed interface. The first menu the user has to deal with – shown in Figure 1 – represents all the rooms of an apartment.



A)



B)

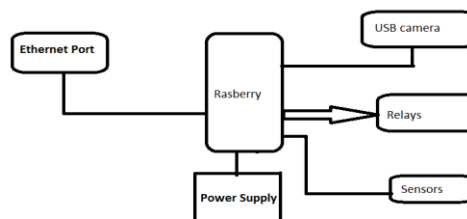


C)

**Fig1: Three screens of a home automation interface, each onerepresenting a different level of the interface. Screen “a” presentsicons representing the rooms, screen “b” presents icons with the items tobe controlled, and screen “c” presents the commands available.**

When a room is selected, a new screen is presented containing all the items available to control in that room. In order to inform which room is selected at the moment (specially important to people with cognitive problems), the icon that represents the room is shown at the top of the screen, while on the right side of it is a “home” icon, that allows the user to come back to the main menu. When an item is selected, a third and last menu level will appear showing the commands available. The icon of the selected room is maintained at the top of the screen, and the icon of the item being controlled is also presented. On the right side of the command screen, two icons are presented: the back icon at the top, that allows the user to go back to the previous level, and the home icon at the bottom, that allows going to the main menu. The concept of using different levels of screens containing icons representing the rooms, the appliances to be controlled and the commands was utilized in our work, but as it is intended to be universal, additional requirements were needed.

### III. PROPOSED METHODOLOGY



**Fig2: Block diagram of proposed system.**

All the hard work is done by an off-the shelf Web browser running on the user terminal, all devices requiring user interaction can be controlled and managed from one device which includes a web browser, such as a personal digital assistant, cell phone, PC, etc. Also, use of webpage based button and display designs reduce the cost of production while making the systems more user-friendly.

Its hardware details are BCM2835 SoC which is 700 MHz Low Power ARM1176JZFS Applications Processor with dual core video core IV@multimedia co-Processor provides open GLES 2.0,Hardware accelerated open VG and 1080p30H.264high profile decode ,Capable of 1Gpixel/s or 24GFLOPS with texture filteringand DMA infrastructure .It has 512MB SDRAM,havinglinux operating system boots from microSD card uses micro USB socket 5v,2A .Also it has 10/100BaseT Ethernet socket . Video output can be taken from HDMI(rev1.3&1.4)with composite RCA(NTSC&PAL) .It also provides audio output using 3.5mm jack,HDMI.Provides 4 USB2.0 connectors for USB connection.It has GPIO connectorides 40 GPIO pins also has camera connector and JTAG .Display connector with for display serial interface 15 way flat flex cable connector with two data lanes and click lane .It also contains timers,interrupt controllers,I2C master,I2C SPI slave UART.In this proposed methodology Html pages are imported at the Ethernet port through browser .These pages are decoded at processor then according to that processor will send command to turn it on and load is controlled .Also sensors data is acquired .firstly it is converted from analog to digital and then exported to Ethernet port on web pages .

### IV. CONCLUSION AND FUTURESCOPE

This paper presents how to build web server using Raspberry & TCP/IP protocol toaquire and control data which can be used anywhere like luxurious home ,factories, industrial automation . This paper proposed an economical Ethernet based web server to monitor & control home area network that controls the home appliances & receives data from sensors. The data can be transmitted over a static IP address. To view and control the device anywhere in the world over the internet dynamic IP through GPRS can be used .

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