Chapter 1

INTRODUCTION

In every college notice published by college faculties reach to the student very rarely. The method used to spread the information is reading it in every classroom. This is not an effective one on the basis of both ranges of reach and the time and energy used. Also in every college there will be a big crowd in front of the college notice board at the time of exams. Students are really struggled to find their seating arrangement. To avoid this we introduce a low cost fully automatic display system.

The proposed display system will have of a touchscreen interface. Using this interface we can input and output data without the need of any other input devices like mouse, keyboard etc. The system's hardware also consists of a Raspberry Pi. Using Raspberry Pi the notices or exam seating arrangement information are fetched from a distant computer located at the office room of the college through a common Wi-Fi network and it is outputted through the touchscreen. The window of touchscreen will have sufficient controls for easy navigation. The touchscreen make the student interface a lot simpler.

Chapter 2

PROJECT OBJECTIVES

In colleges the notices published by college faculties reach the student vary rarely. The conventional way is to read it in every classroom. This is not an effective one on the basis of range of reach, time and energy consumed. Also in every college there will be a big crowd in front of the college notice board at the time of exams. Students are really struggled to find their seating arrangement. This is because of the difficulty to find their own seating position. To avoid this we introduce a low cost fully automatic display system.

The proposed display system will be a viable replacement for the above issues. This system is an interactive one so the usability of this system is more. The system's hardware consists of a Raspberry Pi and a touchscreen. Using Raspberry pi the notices or exam seating arrangement information are fetched from the server through a common Wi-Fi network and it is displayed on the touchscreen. By using this system the every student can find his own seating position with whole arrangement of the class room.

Chapter 3

SYSTEM OVERVIEW

The whole system can be divided into two parts. One is a computer through which the data is entered. The computer is connected to a Wi-Fi network all the time. The exam seating arrangements and new notices are saved into a single folder in the computer. The folder is shared over the connected network. We can use a desktop or a laptop or even a raspberry pi with keyboard as a computer in this part.

The second part consists of a Raspberry pi and a touchscreen. The raspberry pi is also connected to the same Wi-Fi network to which the computer in the first part is also connected. Raspberry Pi is powered by a normal 5v 2A continuous power supply. Touchscreen is interfaced with the Raspberry Pi using an adaptor board. A common power supply is used for both Raspberry pi and the touchscreen. Touchscreen used is an official Raspberry pi seven inch screen. Both the Pi and the adaptor board is connected together and screwed at the rear portion of touchscreen. This feature makes the display portion very small and easy to use. After providing good case the display system can be fitted in any wall very easily with no problem for the functionality.

A server is created in the raspberry pi with apache and PHP. Using Raspberry pi the shared folder is accessed through the network using PHP commands. A PHP file is created according to the required user interface. Using this PHP file the fetched files are processed according to the needs. This PHP file is stored in the server database and it is displayed through the touchscreen. Using the responsive PHP language according to the input from the users, the fetched data is published.

Chapter 4

METHODOLOGY

4.1 INTRODUCTION

This chapter will divide into two phases. The first phase describes the setting up of raspberry pi, touchscreen, installing various softwares and configuring Pi as a webserver. The second phase deals with design of homepage and flow diagram of software.
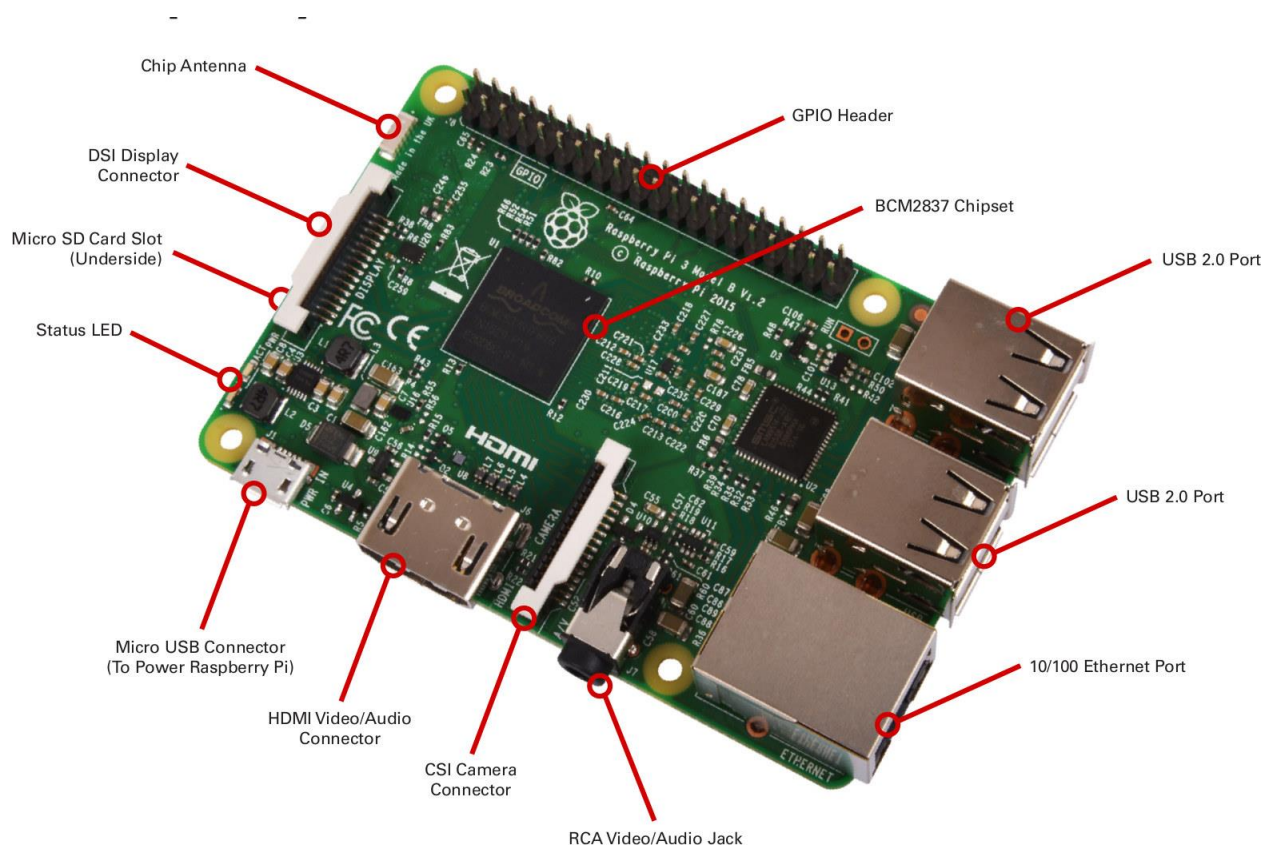
4.2 SETTING UP RASPBERRY PI

Fig1: Raspberry Pi 3 model B

The Raspberry Pi uses a micro USB power connector, as used by most modern smart phones. The PSU (power supply unit) must supply 5V and 2A. PSU can be a direct 5v adapter or a power bank with same output. Raspberry Pi is first booted with NOOBS loaded SD card and the OS is installed.

4.3 SETTING UP AN APACHE WEB SERVER ON A RASPBERRY PI

First, we update the system's package list by entering the following command in LXTerminal:

```
sudo apt-get update
```

Next, we upgrade all installed packages to their latest versions with the command:

```
sudo apt-get dist-upgrade
```

We are going to setup a Apache server since it is a popular web server application you can install on the Raspberry Pi to allow it to serve web pages and Apache can serve HTML files over HTTP, and with additional modules can serve dynamic web pages using scripting languages such as PHP.

We installed the apache2 package by typing the following command in to the Terminal:

```
sudo apt-get install apache2 -y
```

4.3.1 TEST THE WEB SERVER

By default, Apache puts a test HTML file in the web folder. This default web page is served when you browse to http://localhost/ on the Pi itself or http://192.168.1.10 (whatever the Pi's IP address is) from another computer on the network. To find the Pi's IP address, type hostname -I at the command line.0

4.3.2 INSTALL PHP

To allow the Apache server to process PHP files, we need to install PHP5 and the PHP5 module for Apache. For this we used the following commands:

```
sudo apt-get install php5 libapache2-mod-php5 -y
```

4.4 INTERFACING DISPLAY WITH RASPBERRY PI

We selected official Raspberry Pi 7inch touchscreen display since it works more efficiently with the Raspberry pi. Display come up with a LCD screen and an adaptor board. The adaptor board handles power and signal conversion. Only two connections to the Pi are required; power from the Pi's GPIO port and a ribbon cable that connects to the DSI port present on all Raspberry Pi's.

First we need to connect the DSI ribbon cable to the Adaptor board and then to the Raspberry Pi. After this we need to power the display. We have used a common adaptor for both the boards. We attach a 5V 2A adaptor to the conversion board and to power Raspberry Pi we used the GPIO pins.

4.5 CREATING A SHARED FOLDER IN RASPBERRY PI

Install and configure required software

To share network folders to a Windows computer we need to install some special software on the Raspberry Pi. The software providing this capability is called Samba. The Samba software package implements the SMB protocol and provides support for the Windows naming service (WINS) and for joining a Windows Workgroup. The software can be installed and configured in the following way:

sudo apt-get install samba samba-common-bin

After installation configuration of the software is done by opening the file /etc/samba/smb.conf using the command:

sudo nano /etc/samba/smb.conf

The following parameters are set to enable sharing:

workgroup = WORKGROUP

wins support = yes

<u>Setup folder to share</u>

First we created a folder named 'share' inside the root folder of the server using the command *mkdir*. We configure Samba to share it on the network. We edit */etc/samba/smb.conf* using the command:

sudo nano /etc/samba/smb.conf

Scroll to the bottom and add the following:

[PiShare]

 comment=Raspberry Pi Share

 path=/var/www/html/share

 browseable=Yes

 writeable=Yes

 only guest=no

 create mask=0777

 directory mask=0777

public=no

Accessing shared folder from a windows machine

The shared folder can be accessed from a windows machine which is connected in the same Wi-Fi network in which Raspberry Pi is also connected. The Raspberry can be accessed from NETWORK option in the MY COMPUTER. From the network tab we can login into the shared folder only after typing the correct password of the shared folder.

Here we are login using Domain name- raspberrypi, User: pi and Password: raspberry. After login we can just simply put the information in the PiShare folder.
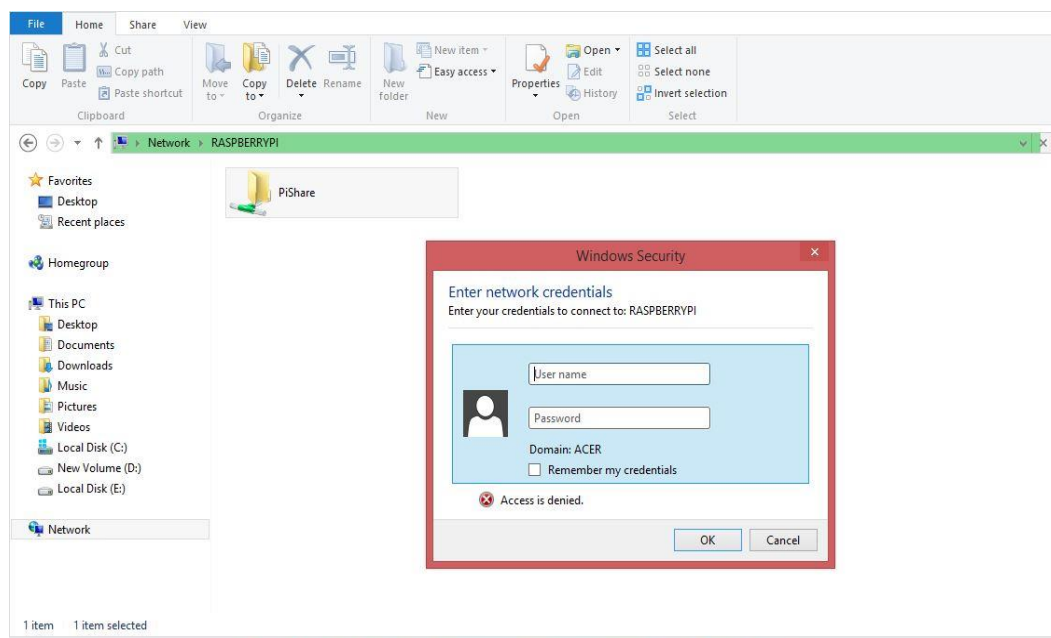

Fig2: Login to shared folder

4.6 INSTALLING VIRTUAL KEYBOARD ON RASPBERRY PI

Without an on-screen keyboard the touchscreen not effective. Since the Raspberry Pi not come with one we need to install a virtual keyboard. Here we use matchbox keyboard for this purpose. Installation process is as follows:

Start off by making sure you Raspberry Pi is up-to-date

Sudo apt-get update
sudo apt-get upgrade

Now install the matchbox-keyboard package

sudo apt-get install matchbox-keyboard

Now boot to the GUI, using the command:

startx

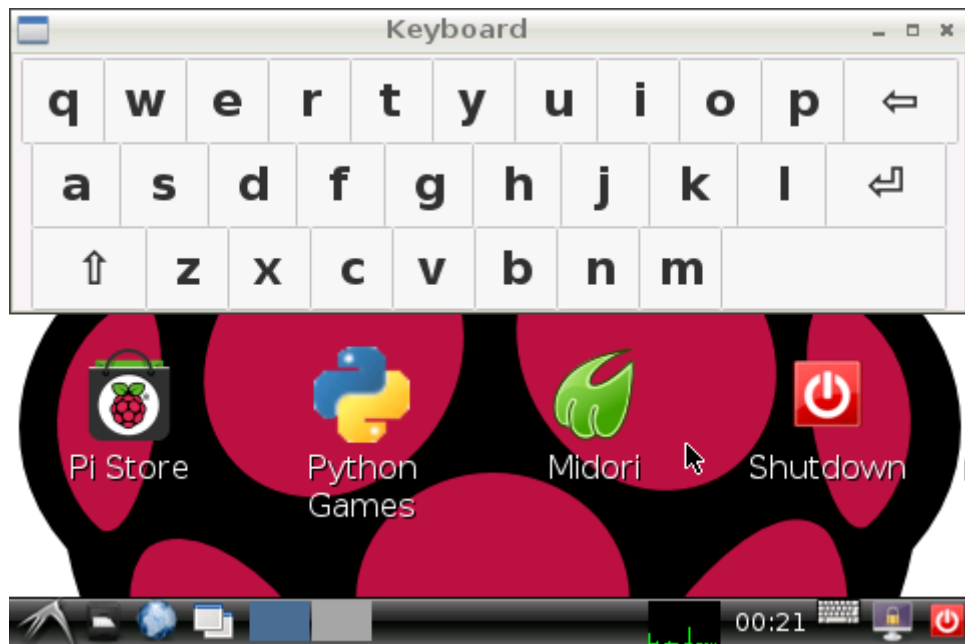To enable up the keyboard, simply go MENU >> ACCESSORIES >> KEYBOARD

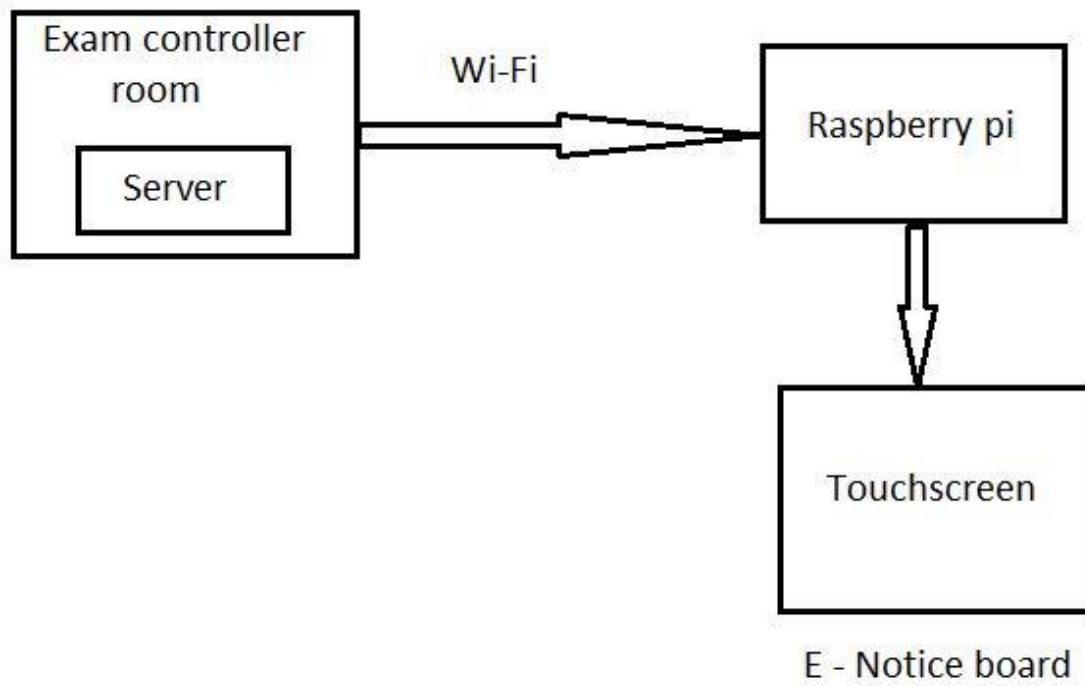Fig3: Virtual keyboard

Chapter 5

BLOCK DIAGRAM

Fig4: Block diagram

The whole system composed of mainly three parts a computer for data entering, Raspberry Pi and a touchscreen. The computer is used to enter new notifications and exam seating arrangements. This system is connected to the same wifi to which the raspberry pi is also connected. The files created in the system are stored in a network shared folder. The Raspberry pi powers the display unit. The Raspberry pi fetches the data from the distant computer over the wifi and displays it through the touchscreen with the required user interface. The required user interface is created using HTML and CSS. The file fetching, processing, displaying etc are done with the help of PHP. We are selected PHP because it is a powerful scripting language used widely over the internet to create dynamic webpages. Using this dynamic property we sort the notices in the shared folder and display the latest notice first in the homepage.

In the display homepage there is provision for several options like notifications, exam seating, contact and a search box. The homepage is shown below:

Fig5: Home page

COLLEGE OF ENGINEERING ATTINGAL
Managed by Institute of Human Resources Development
A Govt. of Kerala Undertaking
Affiliated to APJ Abdul Kalam Kerala Technological University

Date 2017/04/24

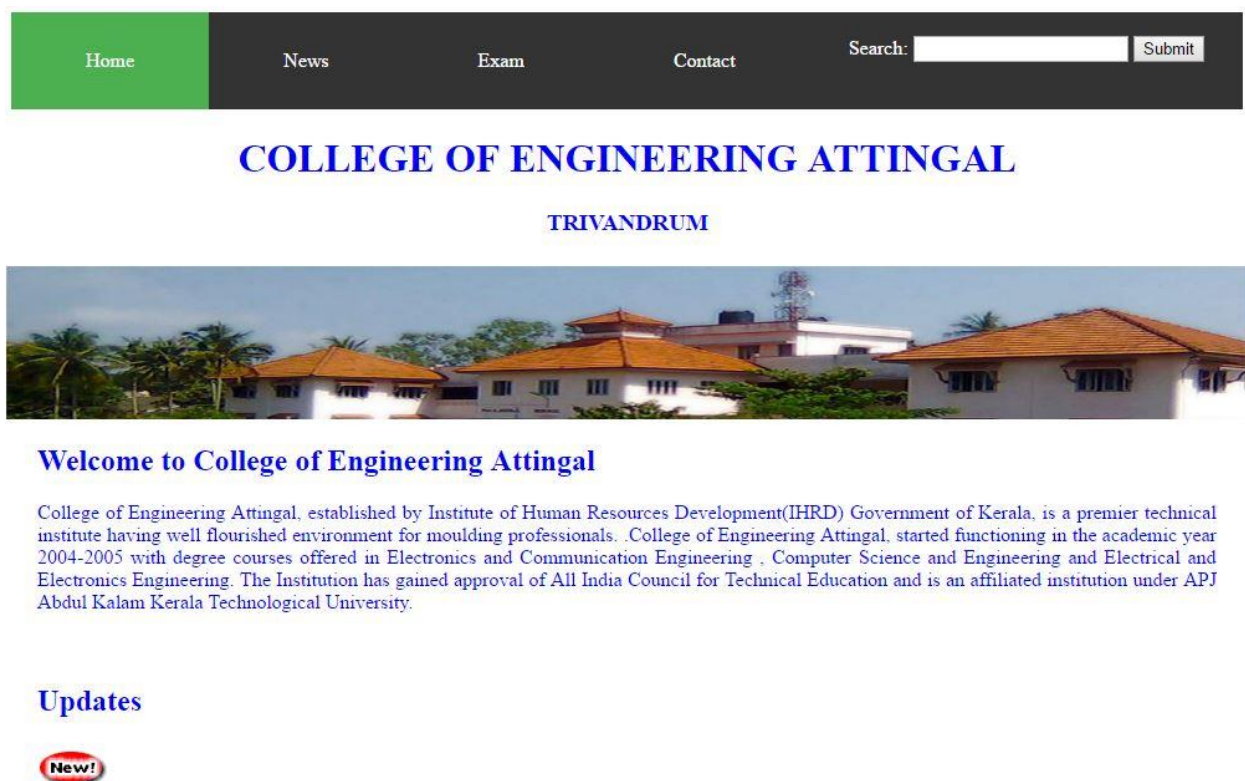Register number: [   ] [Submit]

Fig6:Register number entering page

COLLEGE OF ENGINEERING ATTINGAL
Managed by Institute of Human Resources Development
A Govt. of Kerala Undertaking
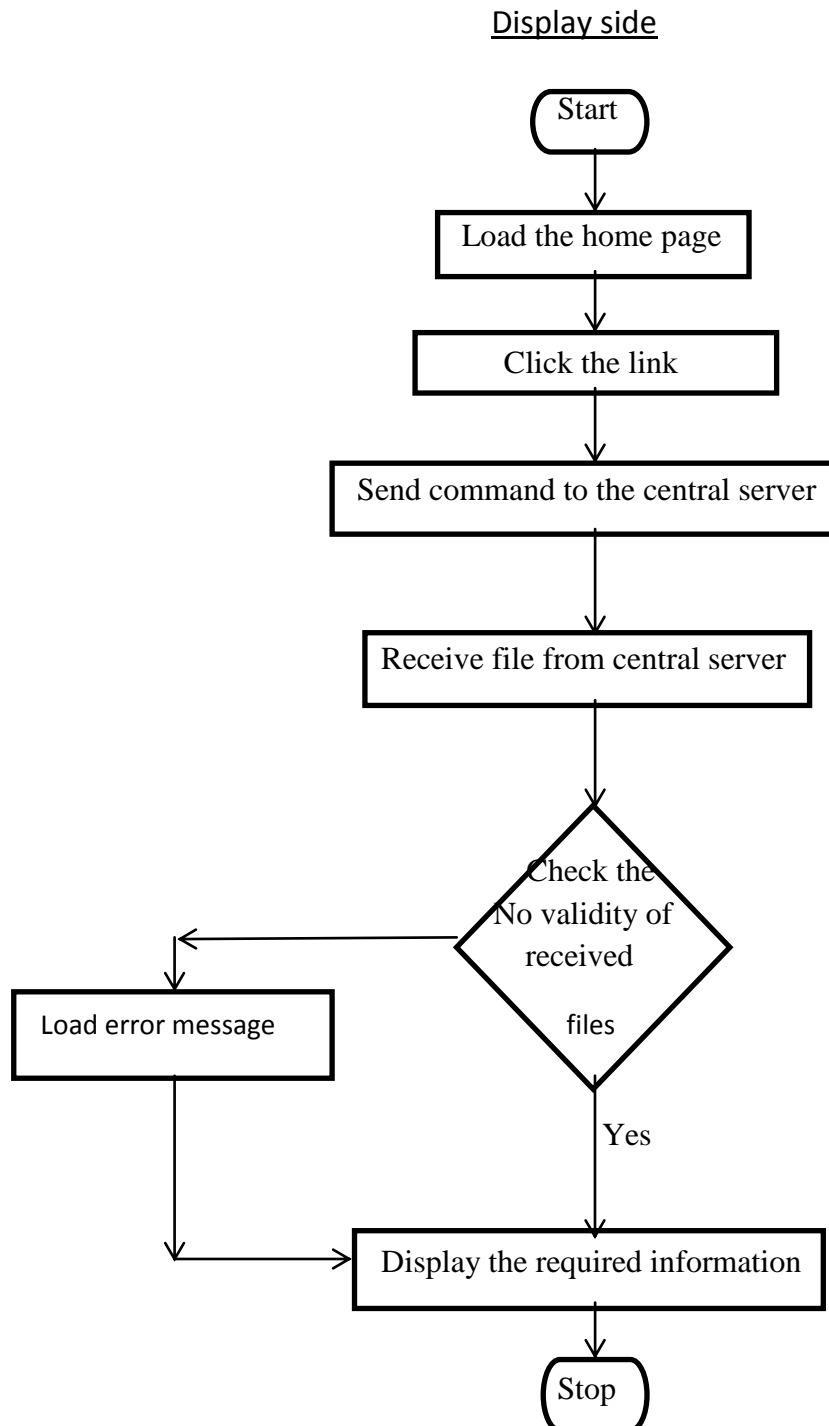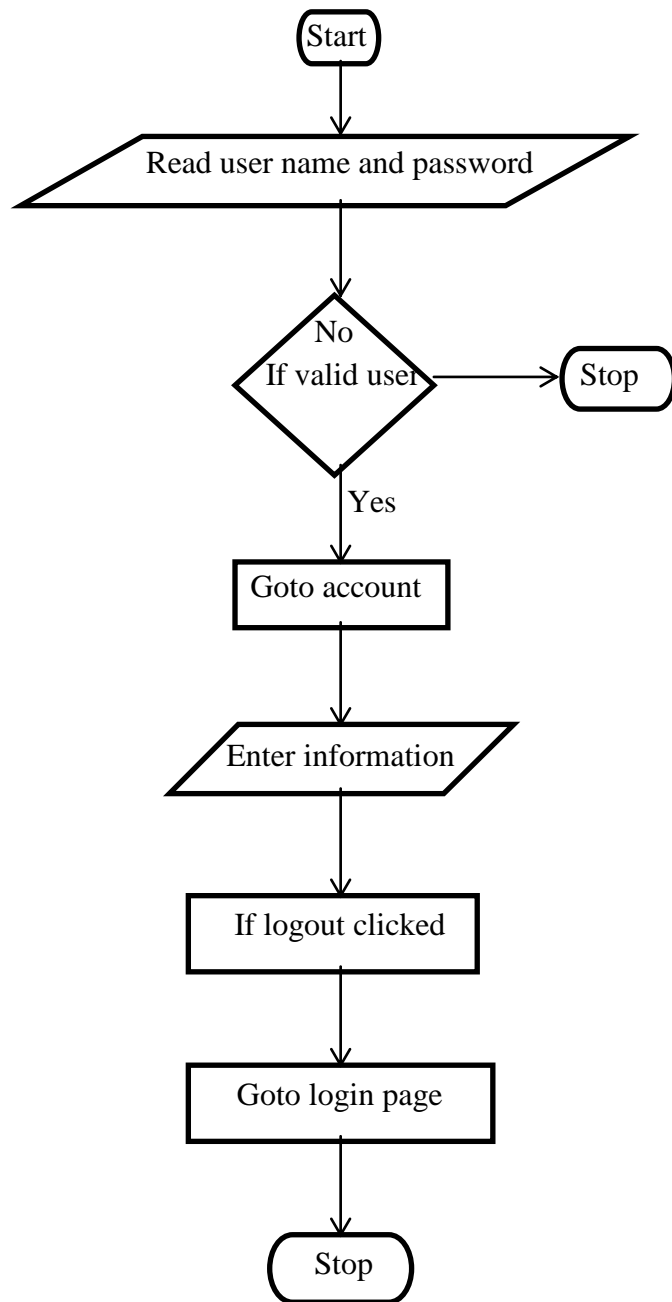#### Affiliated to APJ Abdul Kalam Kerala Technological University

Register No : 13143815

Class Room : L7

Fig7: Seating

Chapter 6

FLOW CHART

Display side

```
        ┌──────────┐
        │  Start   │
        └────┬─────┘
             ▼
   ┌────────────────────┐
   │ Load the home page │
   └──────────┬─────────┘
              ▼
   ┌────────────────────┐
   │   Click the link   │
   └──────────┬─────────┘
              ▼
 ┌──────────────────────────────┐
 │ Send command to the central  │
 │          server              │
 └──────────────┬───────────────┘
                ▼
 ┌──────────────────────────────┐
 │ Receive file from central    │
 │          server              │
 └──────────────┬───────────────┘
                ▼
            ◇ Check the
      No    validity of
 ◄──────── received files      Yes
 │                              │
 ▼                              ▼
┌──────────────────┐   ┌──────────────────────────────┐
│ Load error       │──►│ Display the required          │
│ message          │   │ information                  │
└──────────────────┘   └──────────────┬───────────────┘
                                       ▼
                                   ┌────────┐
                                   │  Stop  │
                                   └────────┘
```

Central server

Start

Read user name and password

No
If valid user → Stop

Yes

Goto account

Enter information

If logout clicked

Goto login page

Stop

Chapter 7

SOURCE CODE

7.1 <u>Homepage</u>

```
<html><head>

<style>

.new {

  width:5%;

   height: .5px;

    }

div.box {

  width: 100%;

  margin: 1px 10px 1px 5px;

  overflow: hidden;

  position: relative;

  z-index: 1;

}

.box img {

  display:block;

  margin: 0px auto;

  height: 200px;

  width: 100%;

  margin: 1px 10px 1px 10px; }

div {

  text-align: justify;

  text-justify: inter-word;
```

```css
      margin: 1px 25px 1px 25px;

}

ul {

    list-style-type: none;

    margin: 0;

    padding: 0;

    overflow: hidden;

    background-color: #333;

}

navbar{

  position: absolute;

  top: 0;

  left: 0;

  z-index: 9999;

  margin: 1px 20px 1px 20px;

}

li {

    float: left;

 }


li a {

    display: block;

    color: white;

    text-align: center;

    padding: 30px 60px;

    text-decoration: none;
```

```css
}
li a:hover:not(.active) {

  background-color: #111;

}
.active {

  background-color: #4CAF50;

}
a{  color: red;

  text-decoration:none;

  }

  form{

      padding:18px 6px;

      color: white;

 }
```
```html
</style> </head>

<body>

<nav class="navbar">

<ul>

  <li    width="300px"><a class="active" href="home.php">Home</a></li>

  <li><a href="exam.php" target="blank">News</a></li>

  <li><a href="seating.php" target="blank">Exam</a></li>

  <li><a href="contact.php">Contact</a></li>

  <li> <div align='right'>

<form action="search.php" method="post">

    Search: <input type="text" name="term"/>

    <input type="submit" name="submit" value="Submit" />
```

```
</form>

</div></li>

</ul>

</nav>

<div style="clear:both"></div>

</div>

<font color="#0000FF">

<h1 style="text-align:center">COLLEGE OF ENGINEERING ATTINGAL</h1>

<h3 style="text-align:center">TRIVANDRUM</h3>

<div class="box">

<img src="baner1.jpg" alt="myPic" />    </div>

<div><h2><strong>Welcome to College of Engineering Attingal</strong><br>

</h2>
```

College of Engineering Attingal, established by Institute of Human Resources Development(IHRD) Government of Kerala, is a premier technical institute having well flourished environment for moulding professionals. .College of Engineering Attingal, started functioning in the academic year 2004-2005 with degree courses offered in Electronics and Communication Engineering , Computer Science and Engineering and Electrical and Electronics Engineering. The Institution has gained approval of All India Council for Technical Education and is an affiliated institution under APJ Abdul Kalam Kerala Technological University.</div>

```
<div>

<font color="#0000FF">

<h2 style="text-align:left">Updates</h2>

</font>

</div>

<font color="#0000FF">

<div class="new">
```

```php
    <img src="new.gif" alt="myPic" /><br>
    </div><div>
<?php
 $i=0;
$files = array();
$dir = new DirectoryIterator('.');
foreach ($dir as $fileinfo) {
  $files[$fileinfo->getMTime()] = $fileinfo->getFilename();
}
krsort($files);
foreach($files as $file){
    if ($file == "index.php" or $file == "." ){
    }else{
       while( $i < 1) {
       $i++;
  $myfile = fopen("$file", "r") or die("Unable to open file!");
  echo "<br>"."<br>".fread($myfile,filesize("$file"))  . "<br>";
       fclose($myfile);
  $link = "<a href='./exam.php'>Read more </a><br />";
          print $link;
          print "</br>";}
       } }
?>
</font>
</body>
</html>
```

7.2 News

```html
<html><head>
<style>
body{
height=500000px;
background-color:#00000;
background-image:url(file:///baner.jpg);
background-repeat:repat;
#content{
position:static;
height=500000px;
}
}
div.box {
width: 100%;
margin: 1px 0px 0px 0px;
height: 128px;
overflow: hidden;
position: center;
z-index: 1;
}
.box img {
display:block;
margin: 5px auto;
}
ul { display:table; margin:0 auto;}
</style>
</head>
<body>
<font color="#0000FF">
```

```php
<h1 style="text-align:center">Notices</h1>
<div align='center'>
<?php
echo "Date " . date("Y/m/d") . "<br>";    ?>
<font size="5px">
<div align='justify'>

<?php

 $i=0;
 $files = array();
 $dir = new DirectoryIterator('.');
 foreach ($dir as $fileinfo) {
 $files[$fileinfo->getMTime()] = $fileinfo->getFilename();
 }
 krsort($files);
 foreach($files as $file){
 if ($file == "index.php" or $file == "." ){
 }else{
 while( $i < 1) {
 $i++;
 $myfile = fopen("$file", "r") or die("Unable to open file!");
 echo fread($myfile,filesize("$file")) . "<br>" . "<br>";
 fclose($myfile);}
 $link = "<a href='./$file'> #$file </a><br />";
 print $link;
 print "</br>"; }
 }  ?>
</font>
</div>
</body></html>
```

7.3 Exam seating arrangement

```html
<html><head>
<style>
body{
height=500000px;
background-color:#00000;
background-image:url(file:///baner.jpg);
background-repeat:repat;
#content{
position:static;
height=500000px;
}
}
div.box {
   width: 100%;
   margin: 1px 0px 0px 0px;
   height: 128px;
   overflow: hidden;
   position: center;
   z-index: 1;
}
.box img {
   display:block;
   margin: 5px auto;
}
ul { display:table; margin:0 auto;}
</style>
</head>
<body>
<font color="#000000">
```

```html
 <div class="box">
     <a   href="http://www.ceattingal.ac.in/"><img   src="logoceal.jpg"
alt="myPic" />
     </a></div>
</font>
<font color="#0000FF">
<h1 style="text-align:center"></h1>
 <div align='center'>
 <?php

   echo "Date " . date("Y/m/d") . "<br>";    ?>
<br>
<form action="regno_process.php" method="post">
Register  number:  <input  type="text"  name="name"  minlength="8"
min="13000000"<?php $idtest ?> <br>

<input type="submit">
</form>
<br>
</font>
</div>

</font>

</body></html>
```

7.4. Regno_process.php

```php
<html>
<body>
<div align='center'>
<font color="#000000">

<font size="5px">
<?php
include 'header.php';?>
<br><br>
<strong> Register No : </strong>
<b><?php
include('class.pdf2text.php');
if(isset($_POST['name']) && !empty($_POST['name'])){
        $results=0;
        chdir('share');
        foreach (glob("*.pdf") as $filename) { //will find in all the .pdf
files in current directory
            $a = new PDF2Text();
                $a->setFilename($filename);
                @$a->decodePDF();
                if(isset($_POST['caseinsensitive'])                    &&
$_POST['caseinsensitive']=='on')
                        $count=substr_count(strtoupper($a->output()),
strtoupper($_POST['name']));
                else
                        $count=substr_count($a->output(),
$_POST['name']);
                if($count!==0){
                        echo ''.$_POST['name'].'<br><br>';
```

```php
                    $results++;

                    $temp = explode('.', $filename);
$ext  = array_pop($temp);
$name = implode('.', $temp);
    $link = "<a href='./files/$filename'> $name </a><br />";
        echo 'Class Room : '.$link;

            }

        }
        if($results===0){
                echo "No result found.";

        }
}
?>
</b>
</font>
</div>
</body>
</html>
```

Chapter 8

BENEFITS AND LIMITATIONS

BENEFITS

1. Rush in the last moment can be avoided for students.
2. More comfort for students to get updates of their academics.
3. Emergency news and updates can be brought into student's knowledge without delay.
4. Once implemented, maintenance cost is very less.
5. Only the authority has the access to the content. No edit can be done without the knowledge of institution authority.

LIMITATIONS

1. High initial cost.
2. Regular check up to avoid bugs or hacking threats.
3. Chances of theft.
4. High security is to be provided.

Chapter 9

FUTURE SCOPE

Electronic noticeboard possess wide range of applications in various fields. Even though we introduced this system for publishing latest news and exam seating arrangements, this can be easily modified into a fully operational Kiosk for providing all the campus related information interactively to the students. Then system will be helpful for both the students and other individuals visiting the campus.   Also the system can be used in various industries for giving guidelines and training to the workers.

 Since the proposed system is of very low cost then it can be used as information display at different place. For example in a company the display can be used to provide an overview of the company and the infrastructures. Also this system can be developed to be used to provide seating arrangement for the candidates at the PSC and UPSC exam centers.

Chapter 10

CONCLUSION

The electronic notice board can be implemented in school, college or any other institutions for information sharing. Using this system we can cover a large audience with less manpower utilization. Even though this system requires a considerable initial cost, the further maintenance cost is very less. Which means, once implemented, it will be an asset for the institution. Important updates, exam seating arrangements, emergency situations, campus navigation, etc. can be displayed through this system and one's comfort level inside the campus can be improved. This system will be very helpful for a first time visitor in the institution. Since the system can be implemented in very less area and the power consumption is too low it can be used as a replacement for normal information display with slight modification.

Chapter 11

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3. php.net/manual

4. www.w3schools.com/php

5. raspberrypihq.com

6. ozzmaker.com

7. www.modmypi.com

8. www.sitepoint.com/community

9. www.element14.com

10. en.wikipedia.org

APENDIX A

RASPBERRY PI 3

The Raspberry Pi is a credit card–sized single board computers developed in the United Kingdom by the Raspberry Pi Foundation with the intent to promote the teaching of basic computer science in schools and developing countries. All models feature a Broadcom system on a chip (SOC) which includes an ARM compatible CPU and an on chip graphics processing unit GPU (a Video Core IV). CPU speed ranges from 700 MHz to 1.2 GHz for the Pi 3 and on board memory range from 256 MB to 1 GB RAM. Secure Digital SD cards are used to store the operating system and program memory in either the SDHC or Micro SDHC sizes. Most boards have between one and four USB slots, HDMI and composite video output, and a 3.5 mm jack for audio. Lower level output is provided by a number of GPIO (40) pins which support common protocols like I2C.

RASPBERRY PI 3 MODEL B:

The Raspberry Pi 3 is the third generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016. Compared to the Raspberry Pi 2 it has:

1. A 1.2GHz 64-bit quad-core ARMv8 CPU
2. 802.11n Wireless LAN
3. Bluetooth 4.1
4. Bluetooth Low Energy (BLE)

Like the Pi 2, it also has:

- 1GB RAM
- 4 USB ports
- 40 GPIO pins
- Full HDMI port
- Ethernet port
- Combined 3.5mm audio jack and composite video
- Camera interface (CSI)
- Display interface (DSI)
- Micro SD card slot (now push-pull rather than push-push)
- VideoCore IV 3D graphics core

The Raspberry Pi 3 has an identical form factor to the previous Pi 2 (and Pi 1 Model B+) and has complete compatibility with Raspberry Pi 1 and 2.

Specifications:

- SoC: Broadcom BCM2837 (roughly 50% faster than the Pi 2)
- CPU: 1.2 GHZ quad-core ARM Cortex A53 (ARMv8 Instruction Set)
- GPU: Broadcom VideoCore IV @ 400 MHz
- Memory: 1 GB LPDDR2-900 SDRAM
- USB ports: 4
- Network: 10/100 MBPS Ethernet, 802.11n Wireless LAN, Bluetooth 4.0
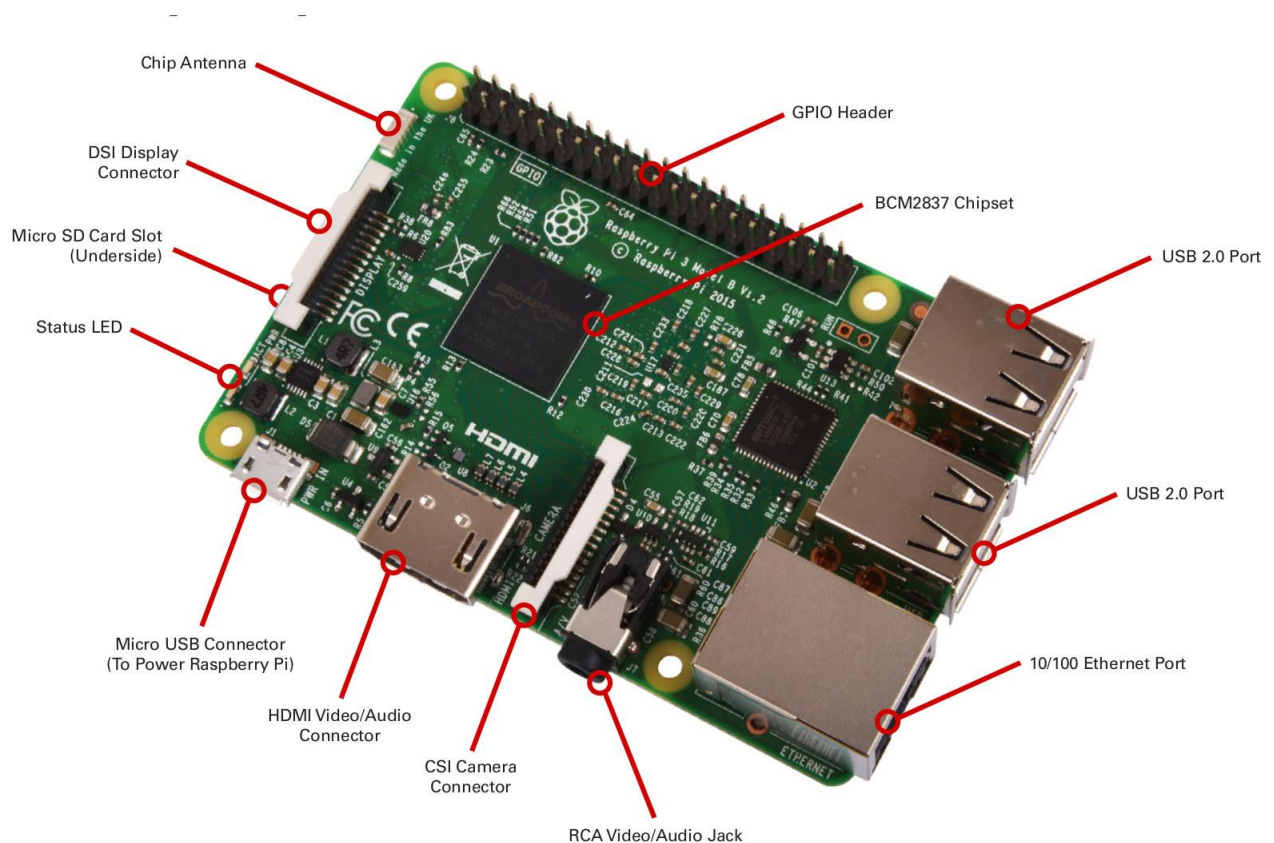

Fig8: Raspberry Pi 3 Model B

APENDIX B

Raspberry Pi 7" Touchscreen Display

The 7" Touchscreen Monitor for Raspberry Pi gives users the ability to create all-in-one, integrated projects such as tablets, infotainment systems and embedded projects. The 800 x 480 display connects via an adapter board which handles power and signal conversion. Only two connections to the Pi are required; power from the Pi's GPIO port and a ribbon cable that connects to the DSI port present on all Raspberry Pi's. Touchscreen drivers with support for 10-finger touch and an on-screen keyboard will be integrated into the latest Raspbian OS for full functionality without the need for a physical keyboard or mouse.

Technical Specification:

- 7" Touchscreen Display

- Screen Dimensions: 194mm x 110mm x 20mm (including standoffs)

- Viewable screen size: 155mm x 86mm

- Screen Resolution 800 x 480 pixels

- 10 finger capacitive touch

- Connects to the Raspberry Pi board using a ribbon cable connected to the DSI port

- Adapter board is used to power the display and convert the parallel signals from the display to the serial (DSI) port on the Raspberry Pi

- Will require the latest version of Raspbian OS to operate correctly

Parts List
1. 7" Touch screen display
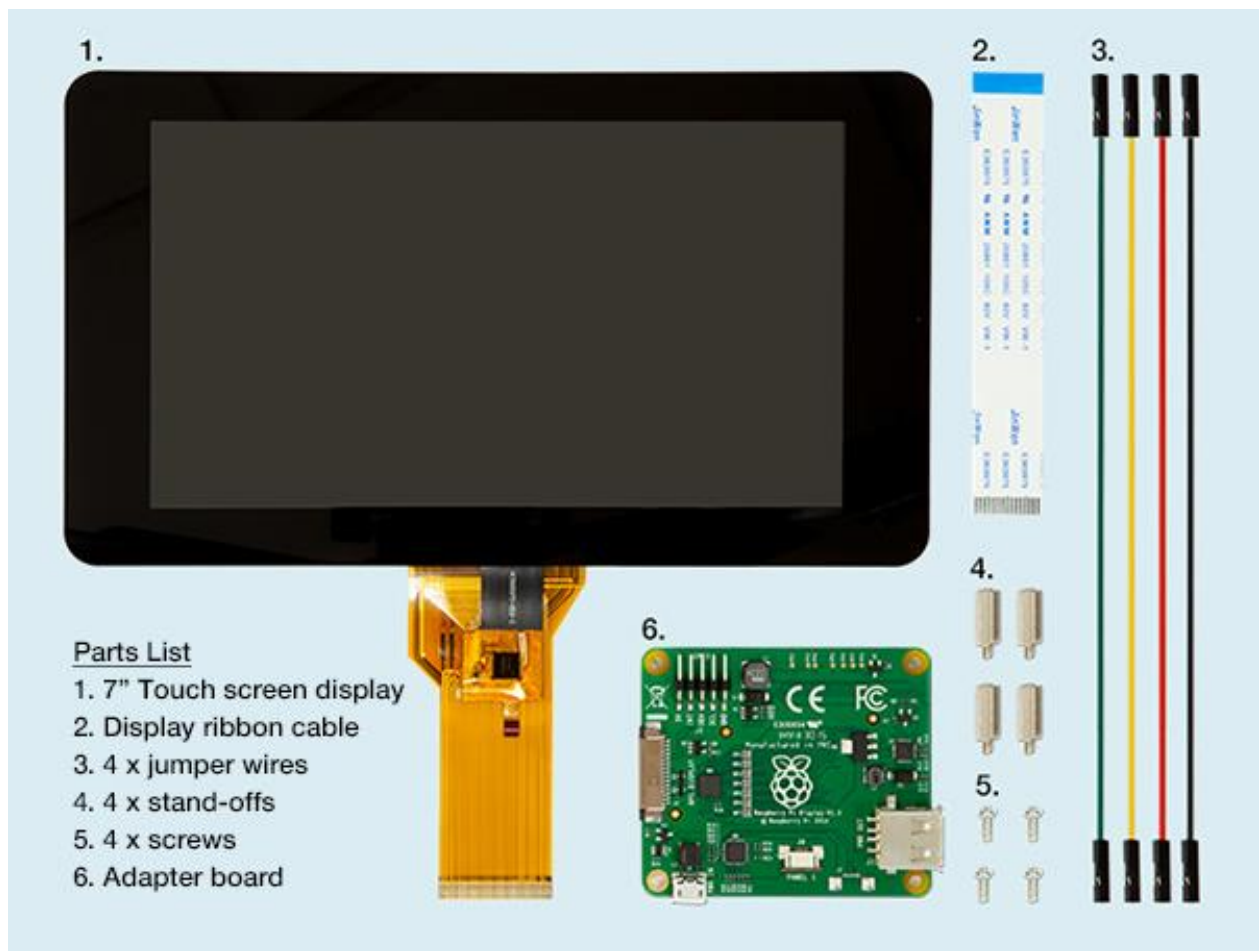2. Display ribbon cable
3. 4 x jumper wires
4. 4 x stand-offs
5. 4 x screws
6. Adapter board

Fig9: Touchscreen display