

# User Manual

Digital Signage Based User Targeted Advertising

Version 1.0

May 2021

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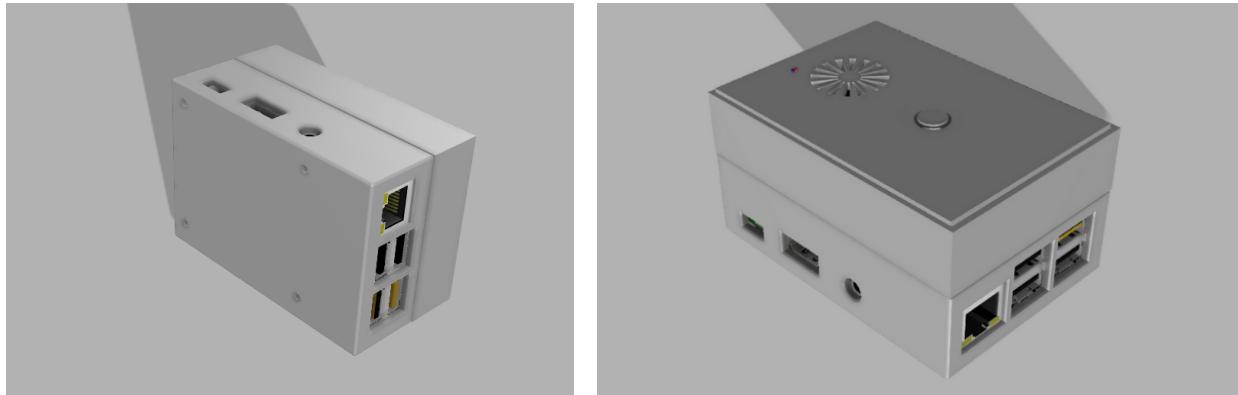
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## General Information

### 1.1. Hardware Overview

The system consists of three separate hardware units. The digital signage control unit , user detecting and identifying unit and the smart power supply unit.

#### 1.1.1. Physical Outer design



Digital Signage Control Unit

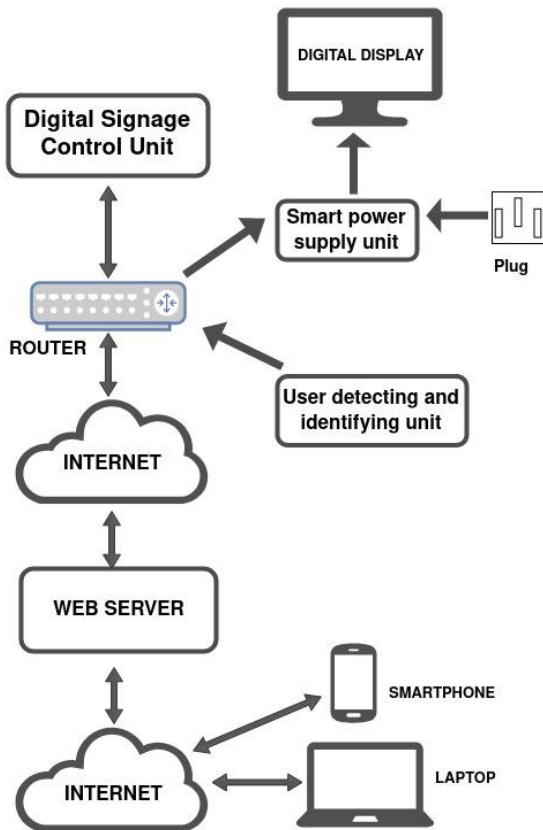


User Detecting and Analyzing Unit



Smart Power Supply Unit

### 1.1.2. Schematic Diagram (System Overview)



- ❑ The **Digital Signage Control unit** and the **User Detecting and Identifying unit** both work together by communicating with each other through the web server through the internet.
- ❑ The **Smart Power Supply unit** connects and powers up the digital screen. Digital Signage Control Unit connects with the digital display through an HDMI Connection and displays advertisements.
- ❑ The whole system can be controlled through the mobile application by adding the connected devices to the user's login account.

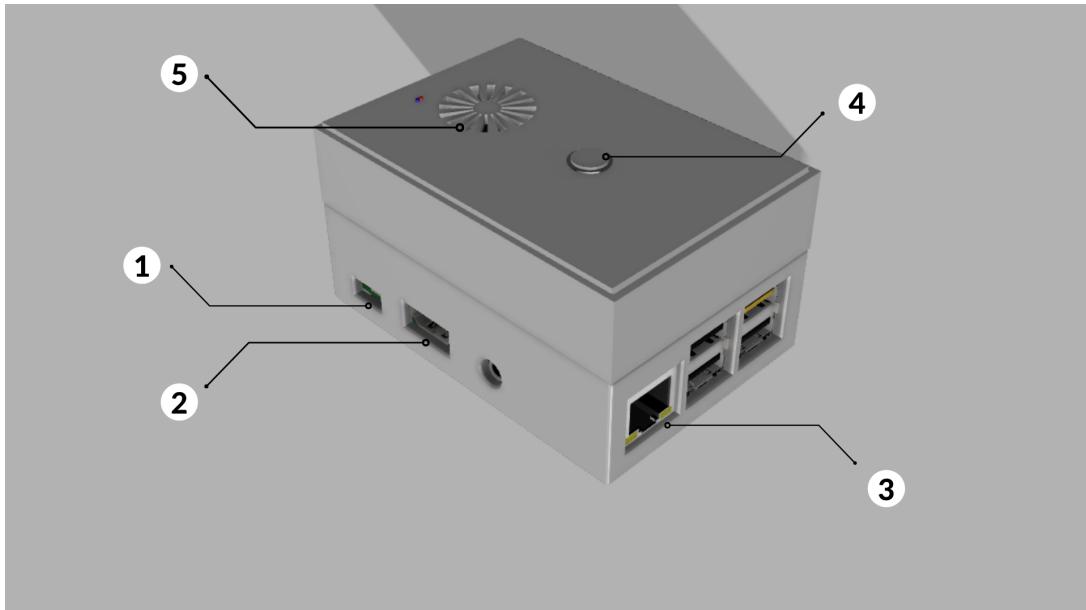
System Overview

## 2. Units Setup and User Guide

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### 2.1. Hardware units

#### 2.1.1. Digital Signage Controlling Unit



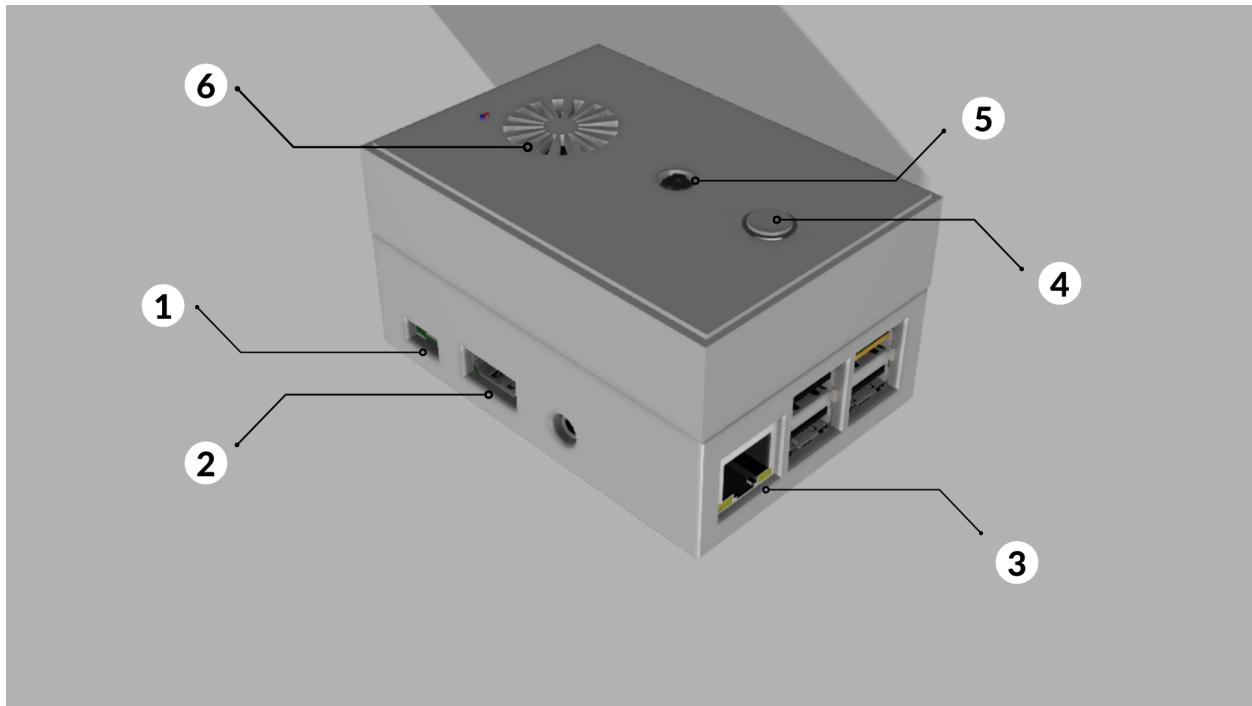
1. Micro USB for RPi power supply (Provided)
2. HDMI port
3. Network Ethernet Port
4. LED Power Switch
5. Cooling Fan

➤ Steps to set up the device

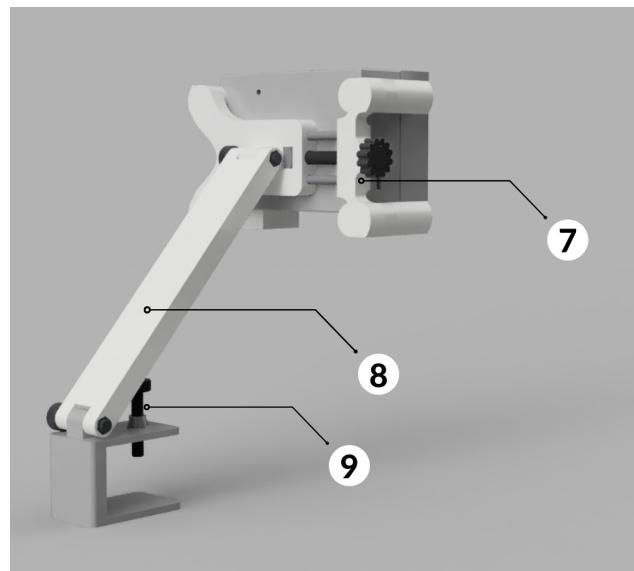
- ❑ Place the device on a horizontal surface closer to the digital screen.
- ❑ Make sure to choose a spot for the unit that protects against overheating.  
**Ensure that the ventilation slots of the cooling fan are not covered.**
- ❑ Connect the device to the digital screen using an **HDMI cable**.

- ❑ Connect the provided Raspberry Pi power supply to the micro USB slot and to main power. (or use POE)
  - ❑ If needed can connect to a network through the Ethernet Port. Make sure to keep the configured wifi network available for autoconnect.
  - ❑ Push the LED power button once to turn on the Digital Signage Unit. Green LED will light up.
- ❑ Now the device is ready to use.**

### 2.1.2. User Detecting and Identifying Unit



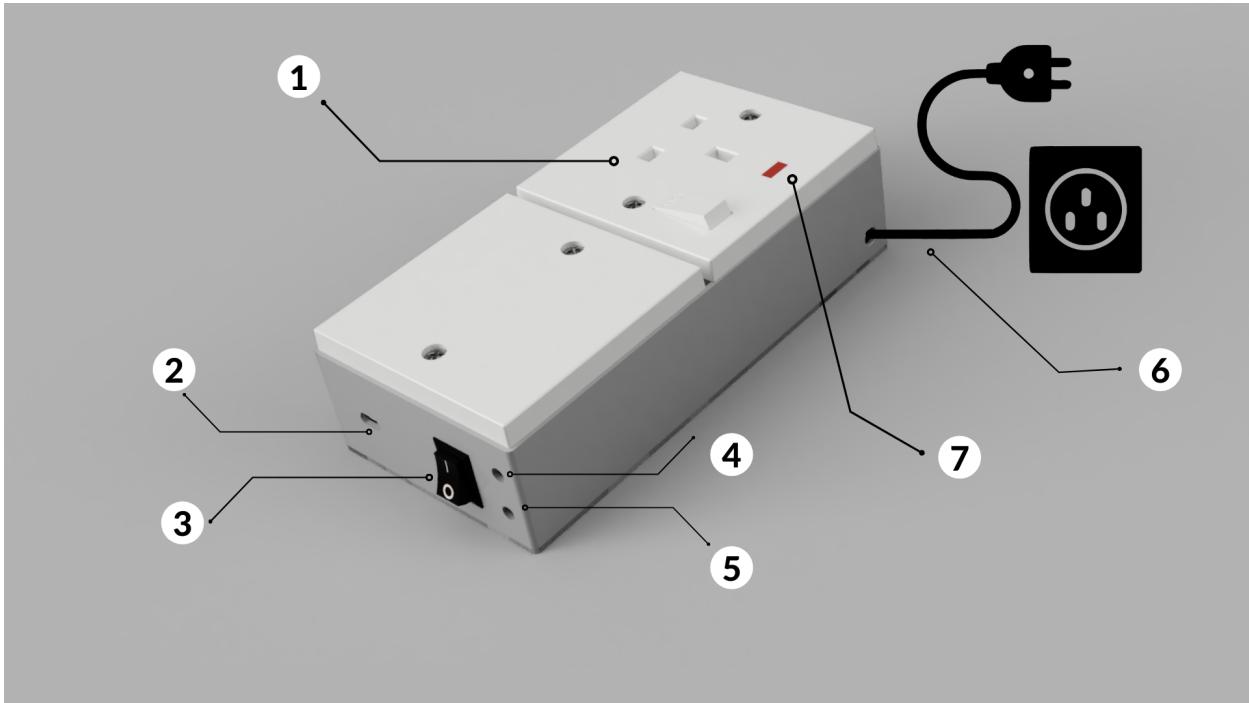
1. Micro USB for RPi power supply  
(Provided)
2. HDMI port
3. Network Ethernet Port
4. LED Power Switch
5. Camera Module
6. Cooling Fan
7. Adjustable Jaws
8. Rotation Handle
9. Screws to Hold



➤ Steps to set up the device

- ❑ User detecting and identifying unit need to be inserted into the support handle jaws and fix it solidly by adjusting them.
- ❑ Place the device as indicated in the design images such that the HDMI and Micro USB inlets are facing downward.
- ❑ Connect the Raspberry Pi power supply to the **micro USB port** and to main power.
- ❑ Adjust the Support handle as desired for better viewing angle and screw the handle to a table for rigidity.
- ❑ If needed can connect to a network through the Ethernet Port. Make sure to keep the configured wifi network available for autoconnect.
- ❑ Push the LED power button once to turn on the User Detecting and Identifying Unit. Green LED will light up.
- ❑ **Now the device is ready to use.**

### 2.1.3. Smart Power Supply Unit



1. Power Socket (for digital screen connectivity)
2. NodeMCU power up port (for maintenance purposes)
3. Rocker Switch
4. Green LED Indicator
5. Red LED Indicator
6. Power cable
7. Power Socket ON/OFF Indicator

➤ Steps to set up the device

- ❑ Place the Smart power supply unit on a horizontal surface closer to the digital screen.
- ❑ Make sure to choose a spot for the unit that protects against overheating.  
**Ensure that the ventilation slots are not covered.**

- ❑ Connect the power cable to the main power supply.
- ❑ Connect the digital screen to the power socket in the smart power supply unit.
- ❑ Keep the rocker Switch turned off initially and power up the unit from main power.
- ❑ The red LED lights up if the device is powered up successfully. Otherwise check the connection again.
- ❑ Now turn on the Rocker switch to power up the wifi module inside. The green LED blinks five times initially and turns off.

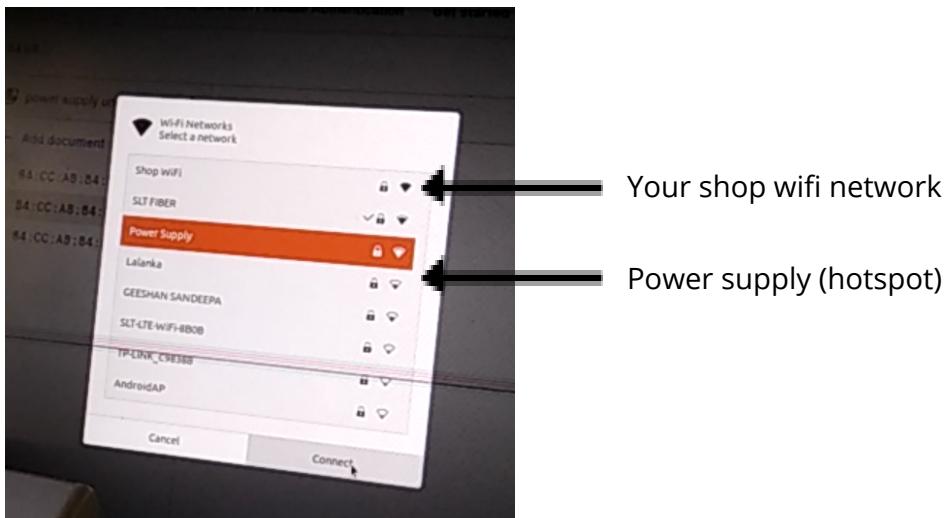
Connect power supply to the shop wifi:

- First time configuration needs to add the shop wifi connection credentials to the smart power supply unit.
- This is done through the “**wifi Manager library**”

#### Steps to connect

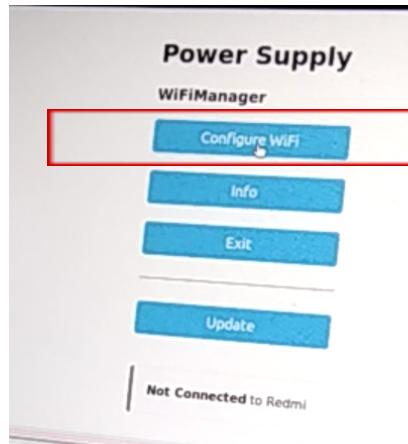
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1. Take a mobile device or a PC with shop wifi connection and near the smart power supply unit.
2. Check available wifi networks in the area.

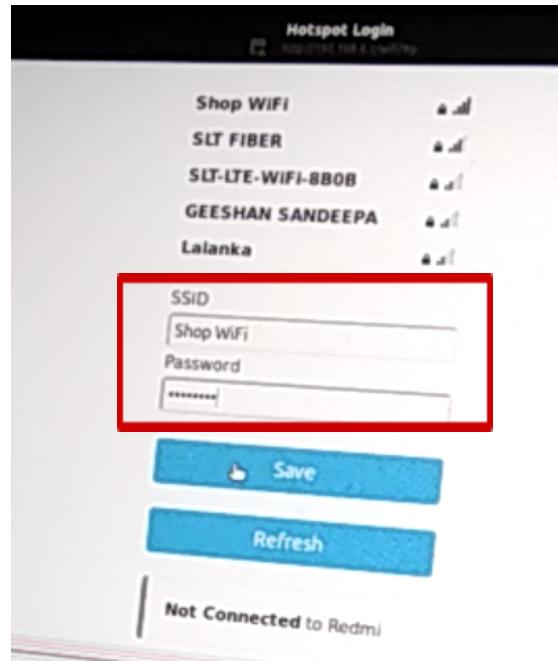


3. Click on the above “**Power supply**” wifi network and click **connect**.

4. Then a browser window will open as below. The wifi manager library page.



5. Click on "**Configure WiFi**" and you get directed to the below page to enter credentials.



6. Enter the "**shop wifi SSID**" and Enter the "**password**" and click save.
7. In a moment the credentials will be saved and stored in the device memory.

- ❑ Now after credentials are saved the Green LED should light up indicating successful connection to wifi.
- ❑ Now the digital screen can be controlled from the mobile app. (Look for details in section 2.2.6.)

#### Further information

- (i) The smart power supply can be used also as a normal power outlet by turning off the rocker switch (stops the wifi connection)
- (i) In a network connection drop out (Green LED starts blinking) the device automatically connects to the configured network once available again.
- (i) Shop owners can change the configured wifi network to the power supply anytime by following the above mentioned steps through the “wifi manager library.”

## 2.2. App Interface (User Portal)

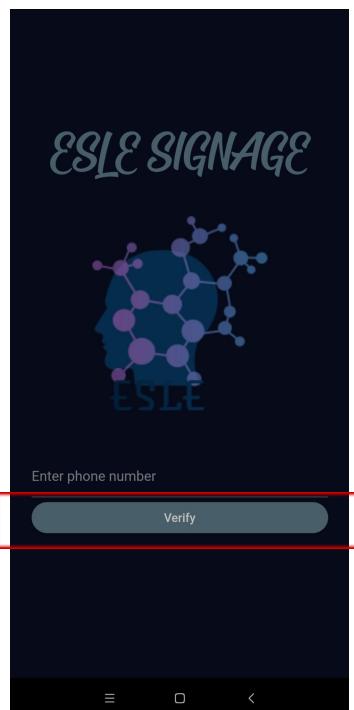
The mobile application controls the whole system after setting up the hardware units as explained above. Users can create accounts and configure and use each device with the given instructions. A step-by-step guide is given how to configure the mobile app to control each of the devices.

### 2.2.1. Download the app

- Download the **Digital Signage App** through google play store.
- Download Google slides app (**recommended**)
  - Web application through browsers (Chrome,Firefox,Edge) also compatible.

### 2.2.2. Login/Registration Page

- When opening the mobile app users get directed to the PhoneAuth page.



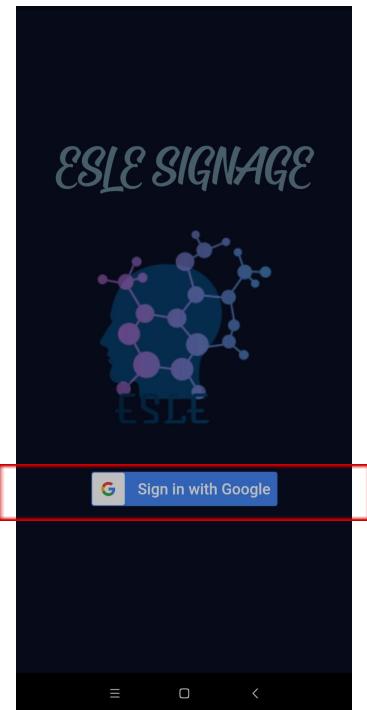
- ❑ Enter a valid phone number with country code (+94) and press the "verify" button to receive the OTP.



- ❑ Enter the received OTP in the textbox and press "Login"

- (i)** Enter Phone number and receive the otp again incase of an unsuccessful attempt.

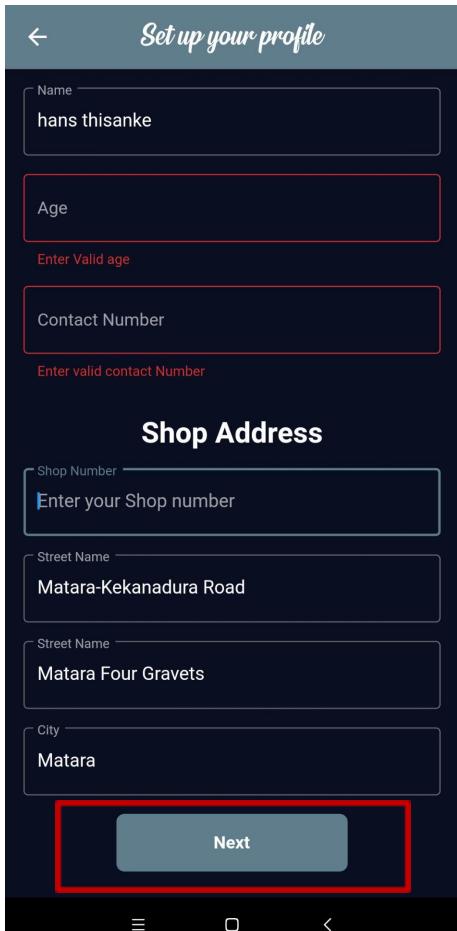
➤ Then the user gets directed to the Google Sign In page.



- Click on “**Sign in with Google**” and select one of the existing google accounts from the displayed menu.

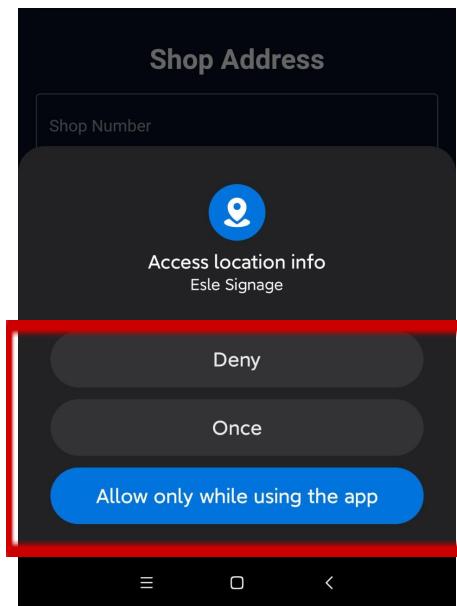
- Once logged in from a google account, until logged out the user stays connected through shared preferences. Users get directed to the main dashboard page when starting the app. No need to enter phoneAuth and SignIn process.

➤ After successful sign in opens up the “Set up your profile” page

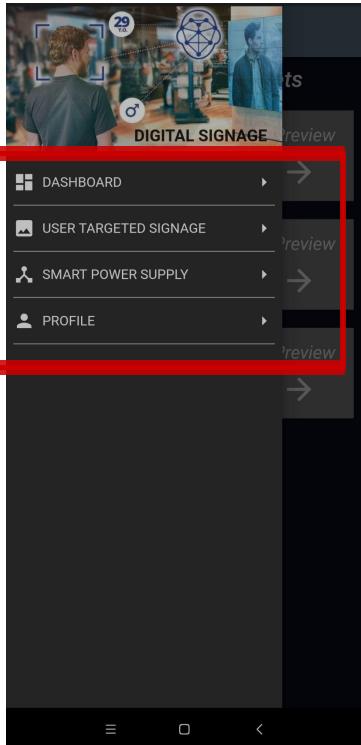


- Personal details and Shop details need to be filled and enter “**Next**” to finish up creating the profile.

- When “**Access location info**” is accepted, shop address details are filled automatically.



### 2.2.3. Navigation Menu



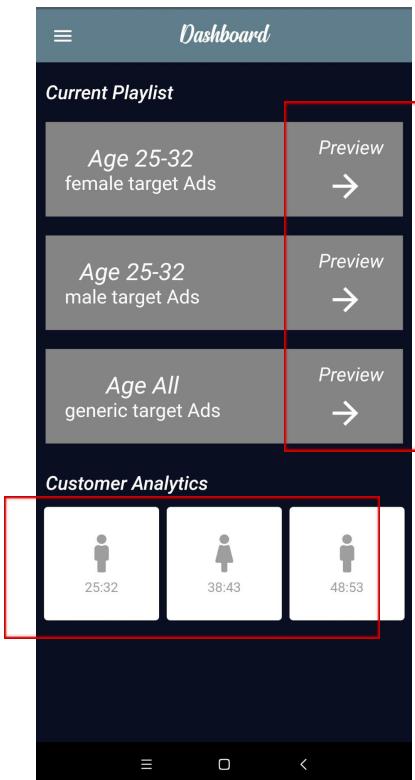
- After successfully login into the app with credentials the user gets the dashboard page with the navigation menu on left.

Navigation menu consists of 4 page directives.

- Dashboard
- User Targeted Signage
- Smart Power Supply
- Profile

- When clicked on each sub menu the users get directed to the specific page inside the app.

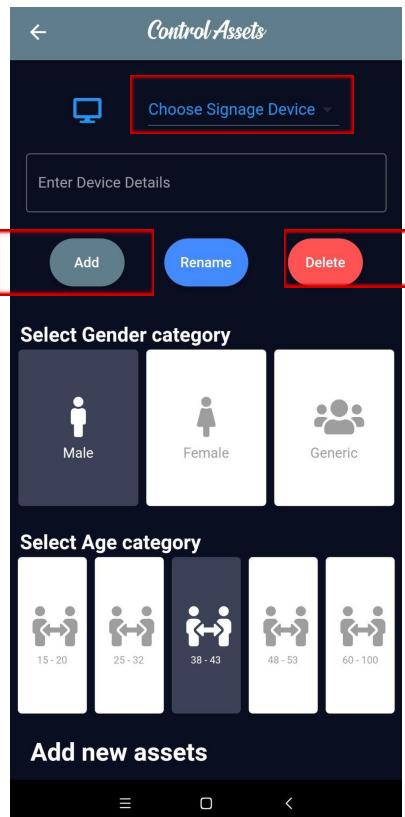
### 2.2.4. Dashboard



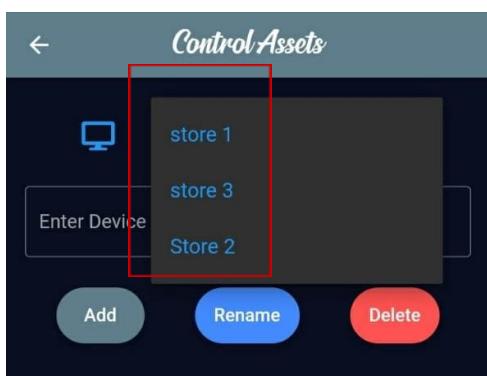
- The dashboard page is where the users see as the main page when logged into the app.
- On the left top corner there is the drawer menu to navigate to other pages.
- The current playlist (advertisements) can be previewed from the **preview panes** separated according to the Age and Gender categories.
- At the bottom contains **Customer Analytics** where the user can analyze which age grouped persons walk in to the shop the most and change advertisements as per the users choice.  
(Analytics update daily)

### 2.2.5. User Targeted Signage Control

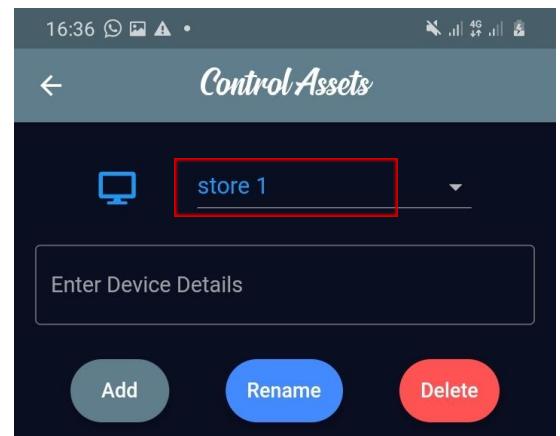
- The User Targeted Signage page is used to “Control Assets” (Scroll down for more options in the page)



- ❑ Users can “**Choose Signage Device**” from the drop down menu to control.
  - ❑ A new user needs to **Enter Device Serial Number** in the textbox and click “**Add New Device**” Button. After successfully adding a valid device, the new device will be added to the drop down menu. Also users can “**Delete Device**” if no longer in use.
- i** Furthermore users can rename the serial number of devices by first choosing the added device and giving a new name (ex: store1, store2, store\_front etc.) and click “**Rename**”. This makes the device name more user friendly.



- ❑ **Drop down menu view** after renaming added signage devices.



- ❑ “**store 1**” signage unit is selected.

➤ After selecting a Signage Device users can edit each advertisement category.

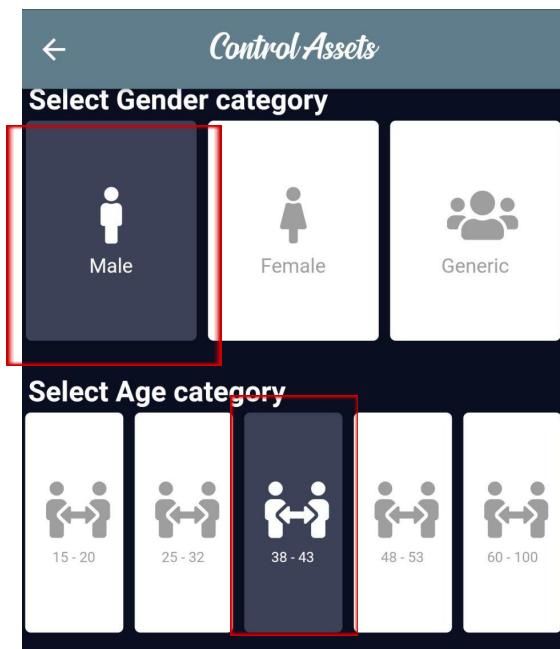
First need to **select the Gender category**

- Male
- Female
- Generic

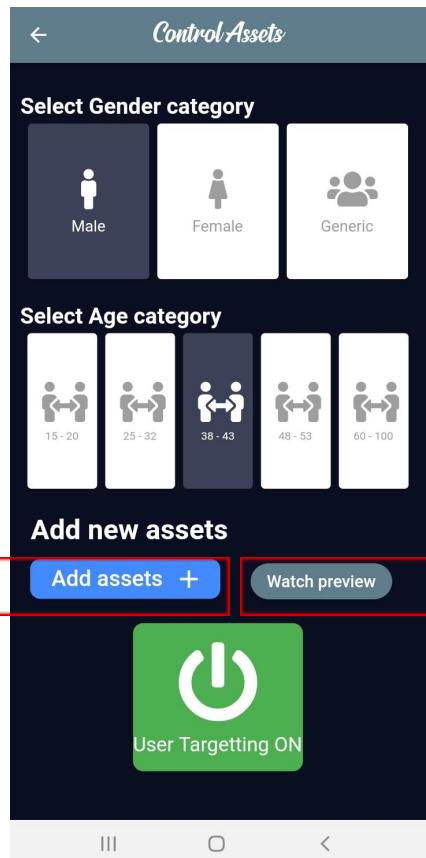
Next **Select Age category**

- 15 - 20
- 25 - 32
- 38 - 43
- 48 - 53
- 60 - 100

**Note:** Scroll down in the page to view more options



➤ Now after selecting the advertisement category users can edit the playlist or preview the current playlist.



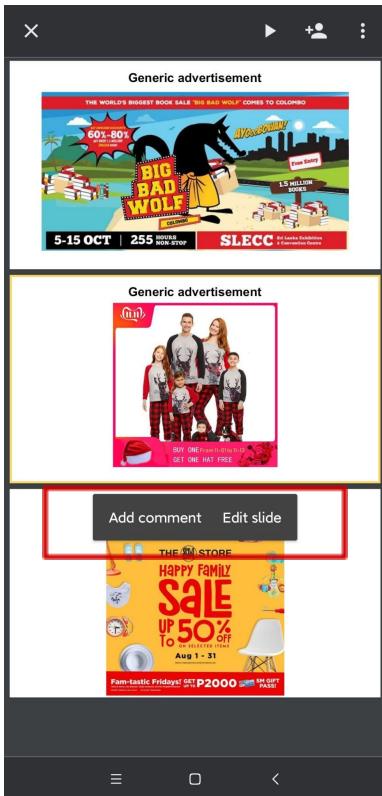
By clicking "**Add assets +**" Button users get directed to Google Slides and to the specific playlist.

After finishing the edit and saving, it gets automatically updated in the playlist category in real-time. Users can then click the "**Watch Preview**" Button to see how advertisements will be displayed on the digital screen.

At the bottom of the page there is this "**User targeting ON/OFF**" Button to enable/disable user targeting in the selected signage device. The user needs to turn it ON if user targeted advertising is expected.

**i** If user targeting is OFF, "Default advertisements" are displayed on the screen.

➤ Using Google slides to add advertisements,



- After clicking the “**Add assets +**” button the selected advertisement category is viewed in google slides.
- By clicking on existing advertisements users can easily “**Edit slides**”

### Steps to edit/save

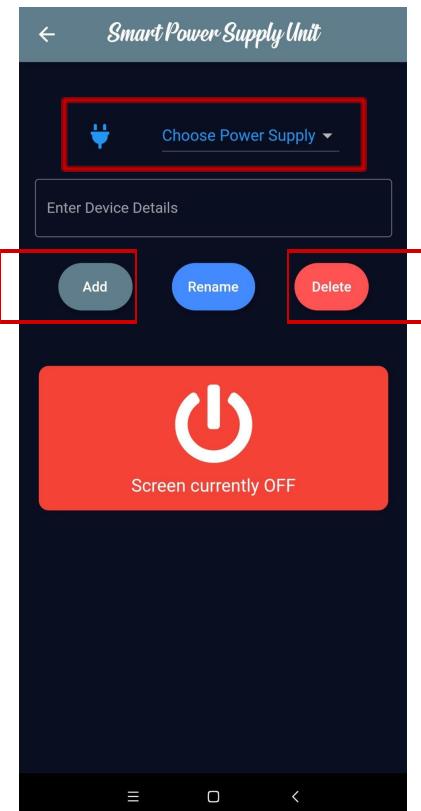
- Edit any slide with text, image, charts etc.
- Add new slides to the playlist.
- When done click on the top ✓ icon to save changes.



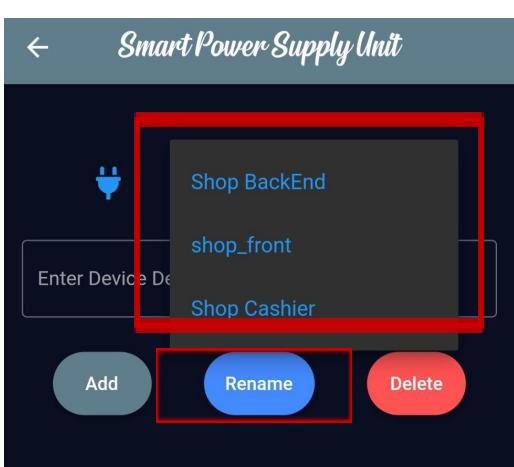
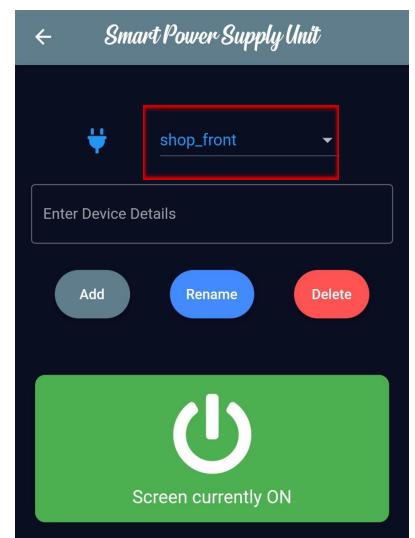
- When saved the latest changes the playlist gets updated in real-time on the digital screen too.
- To go back to the app signage control page click on the top ✕ icon.

### 2.2.6. Smart Power Supply Control

- From the drawer menu click on the “**Smart Power Supply**” option to navigate to this page to control it.



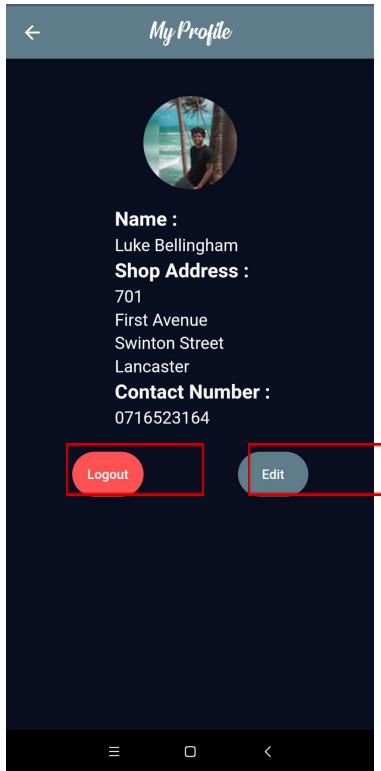
- ❑ At the top the users get the option to “**Choose Power Supply**” unit from the drop down menu.
- ❑ New users can Enter “**Device Serial Number**” on the textbox and click the “**Add**” button to add a new device to the power supply drop down menu.
- ❑ Users can also delete existing devices by typing the device name and clicking “**Delete**” if no longer in use.
- ❑ The selected Power supply unit can be controlled from the “**Screen ON/OFF**” Button. When clicked the digital screen connected to the power supply turns ON/OFF.



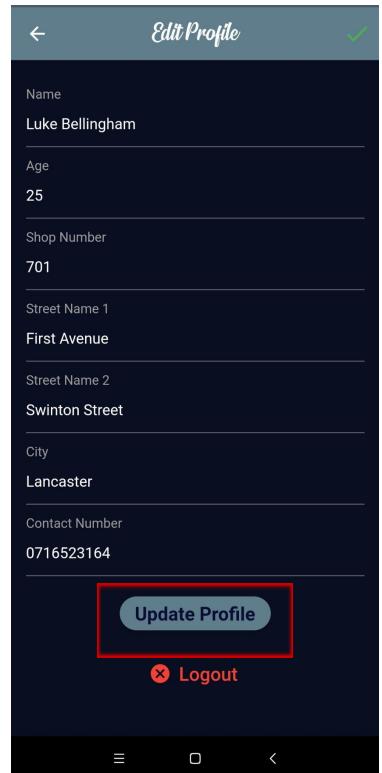
- ❑ **Drop down menu** of the added smart power supply units.
- ❑ Same as in the signage unit page here also can “**rename**” the devices as per the users choice. (**Refer the section 2.2.5 Info**)

### 2.2.7. Profile Page

- From the drawer menu click on the “**Profile**” option to navigate to this page



- ❑ Users can check their details
- ❑ Users can edit profile details by clicking the “**Edit**” button at the bottom.
- ❑ The “**Logout**” button logs the user out from the current google account and navigates back to the “**Google Sign In**” page.
- ❑ “Edit Profile” Page allows users to do any changes on the details.
- ❑ After making changes click on “**Update Profile**” Button to save them.



- ❖ Following above guidelines you can easily control the whole system from the mobile app.

### Troubleshooting

- (i) If the application gets stuck in progress indicators due to lack of connectivity, closing the app completely and restarting will fix the issue.
- (i) In any case the purchased Signage units or Power supply units can't be added, Error message - “**Invalid Serial Number, Try again**” is shown, (check first if you have entered the serial number correctly)  
**Contact us** to immediately fix the issue for you!

### **3. Project Contact Details/Information**

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3rd year project (E/16)

Group 09

Department of Computer Engineering

Faculty of Engineering

University of Peradeniya

#### Contact info:

Tel. +94 71 11 22 333

You will find additional details on,

<https://cepdnaclk.github.io/e16-3yp-digital-signage-based-user-targeted-advertising/>

#### Technical changes

We reserve the right to make technical changes. The diagrams used in these instructions for use are for illustration purposes only and do not represent the original colours of the units.

#### Feedback

Your opinion is important to us! Use the contact links

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