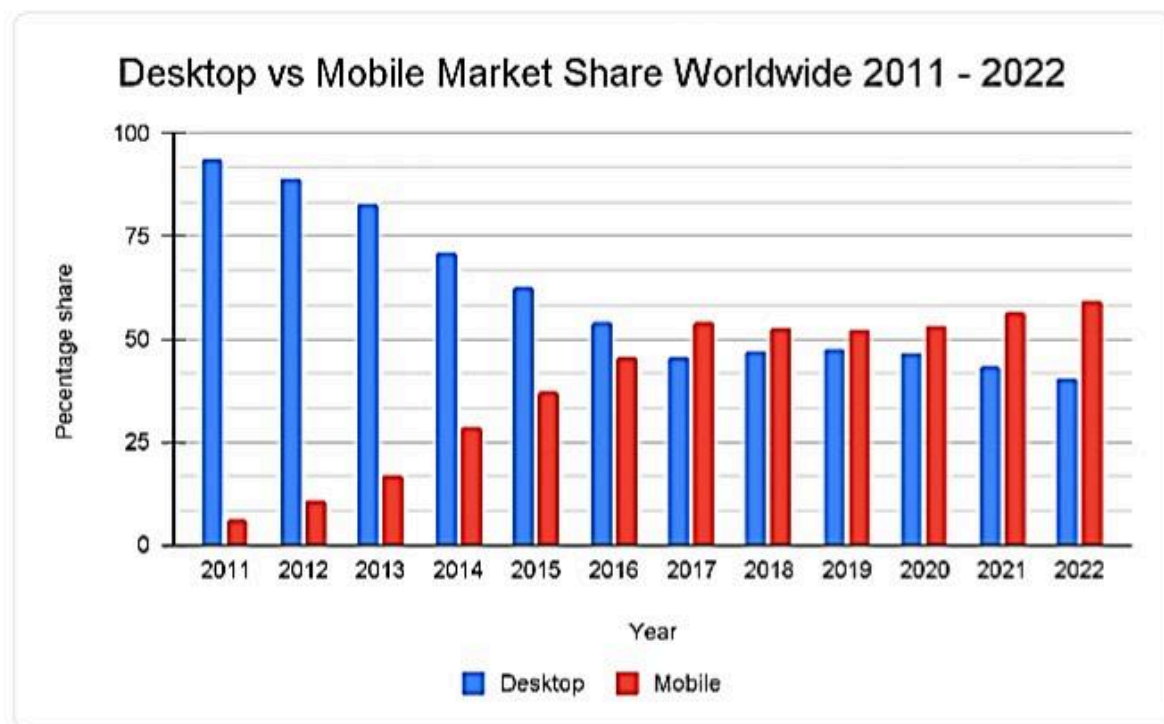*Name:- Prajyot Bhusari*
Github:- Prajyot70

Optimising Circuitverse Simulator For Mobile Devices

In today's world, the usage of smart portable devices is enormous and is increasing day by day, the availability of your digital product on mobile devices is a necessity. According to sources on google about 60-65% of the google searches happen on mobile devices.

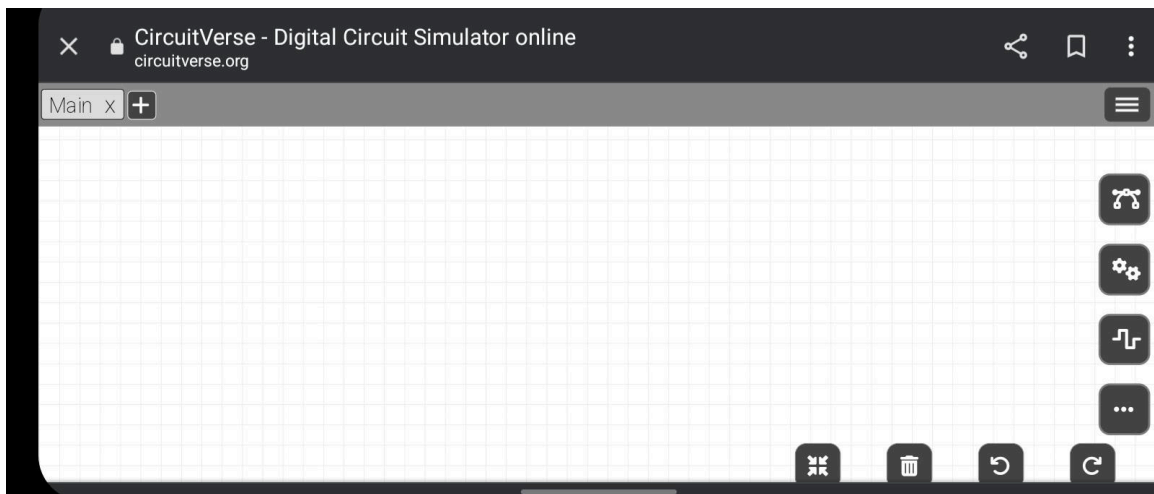Desktop vs Mobile Market Share Worldwide 2011 - 2022

   Therefore, it's necessary to provide your user a good experience at first sight and make a good first impression, as the saying says " First impression is the last impression". A website which looks and performs badly on a mobile device can make a bad impression on the user and might make him leave the product forever. Also many people use smartphones as their primary device either because they can't afford a personal computer or because of its form factor. So to increase new user engagement and retention it is very important to make your website look and perform on mobile devices as or more good as it does on desktop computers.

That is the goal of this project, to optimise the Circuitverse Simulator for mobile devices to provide a better user experience by fixing existing bugs and improving the webview of the simulator on mobile devices.

1. Introduce full screen mode for simulator

Introducing full screen mode here means hiding the website address bar and navigation bar by covering it with the simulator. At present the navigation and web address bar acquire some space on the screen. By introducing full screen mode to the simulator on mobile devices, the small screen space can be used effectively. When the user launches the simulator, it will directly open in full screen mode to avoid hassle. The illustrations for the same are given below.

Existing:-

Proposed:-

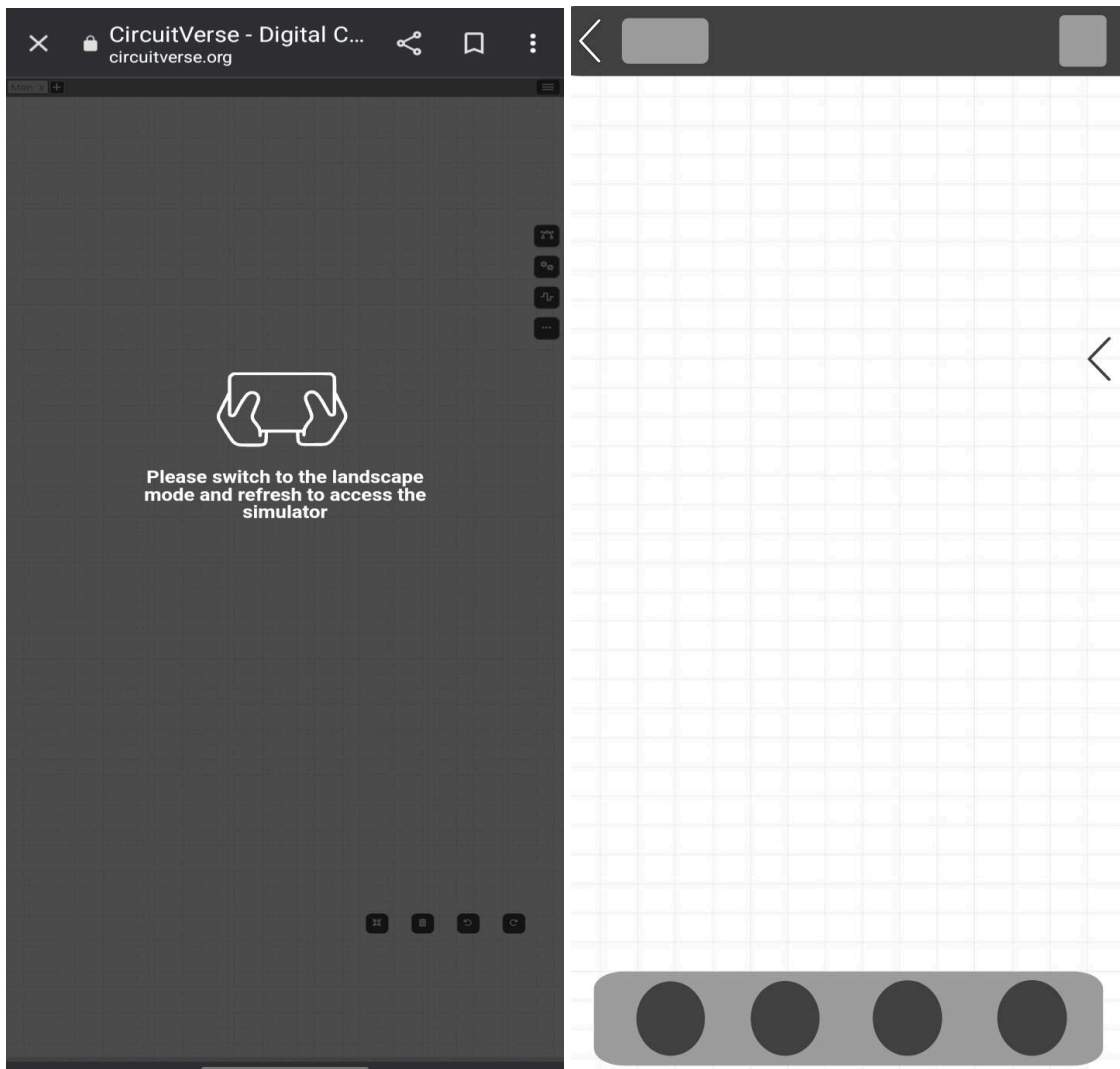## 2. Enable portrait mode for simulator on mobile/portable devices

Enabling the portrait mode for circuitverse simulator on mobile devices will give an extra edge as this feature is only available on mobile devices and will be a plus point as people who are comfortable in using their smartphones in portrait mode, which most do, will engage better with the simulator on their mobile device.
The steps to achieve this are as follows.
- Enabling the portrait mode for circuitverse simulator on mobile devices, which is currently disabled.
- Changing element size and positioning to deliver a better user experience.

The illustrations for the following are given below.

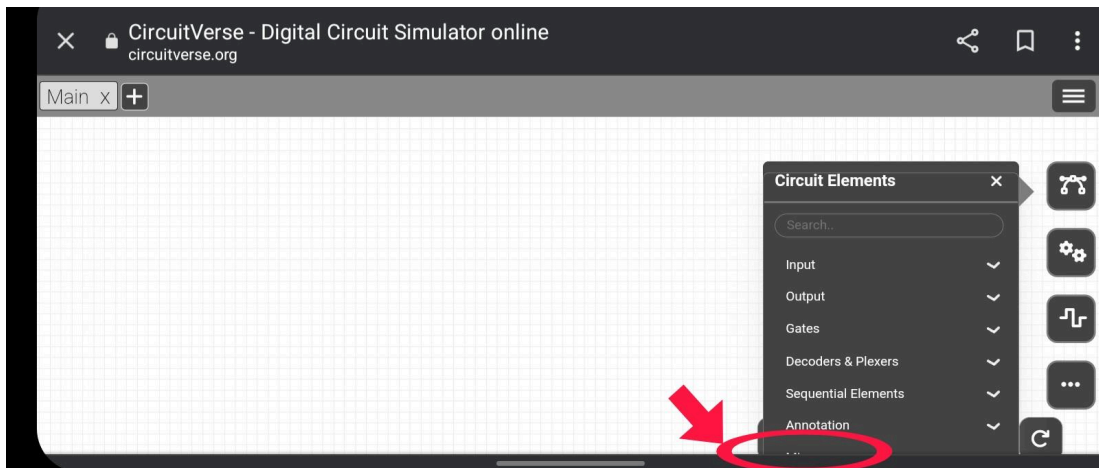**Existing(left) and Proposed(right) :-**
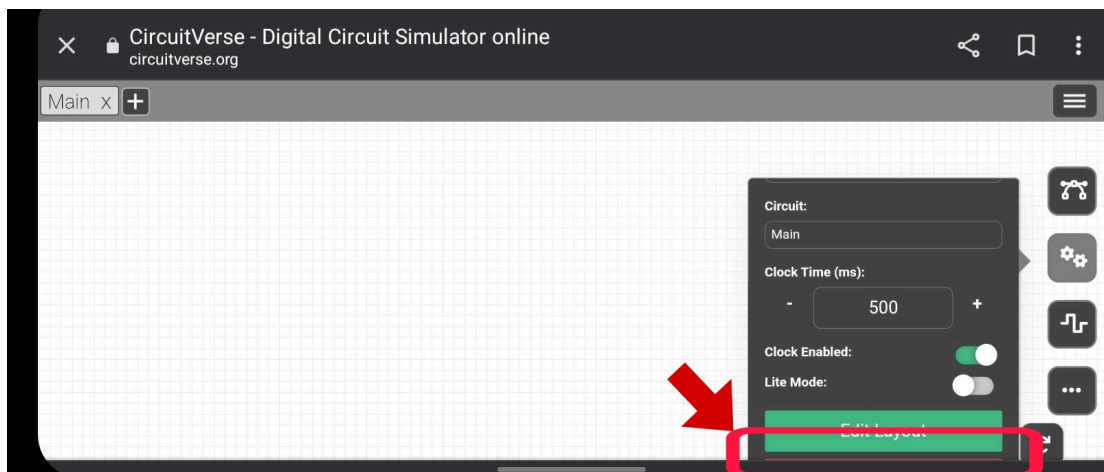
3. Fix existing bugs

There are some bugs in the existing circuitverse simulator, which hinders its usability on mobile devices.

Examples of bugs in the existing Circuitverse simulator are as follows, the illustrations for each bug are given just after the bug statement.
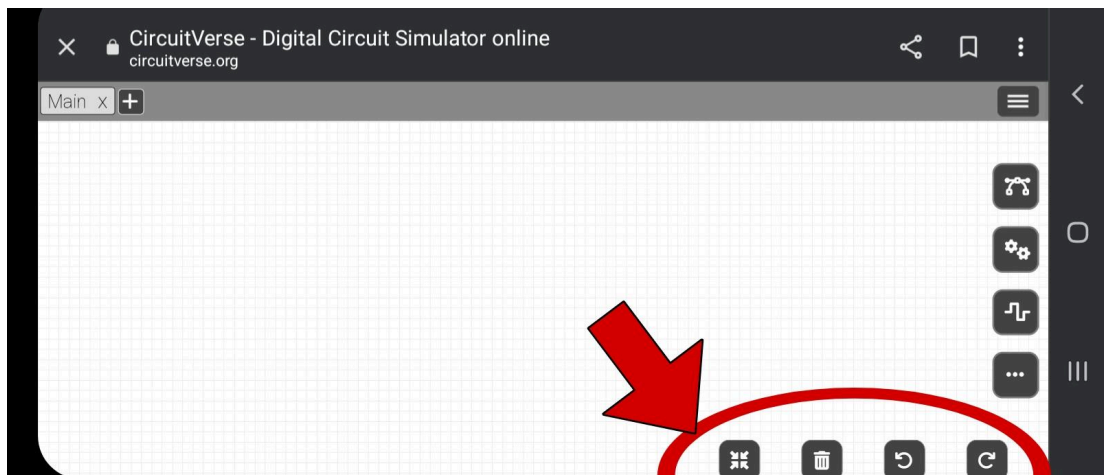
1. Menu options going out of screen and can't be accessed by scrolling or any other way

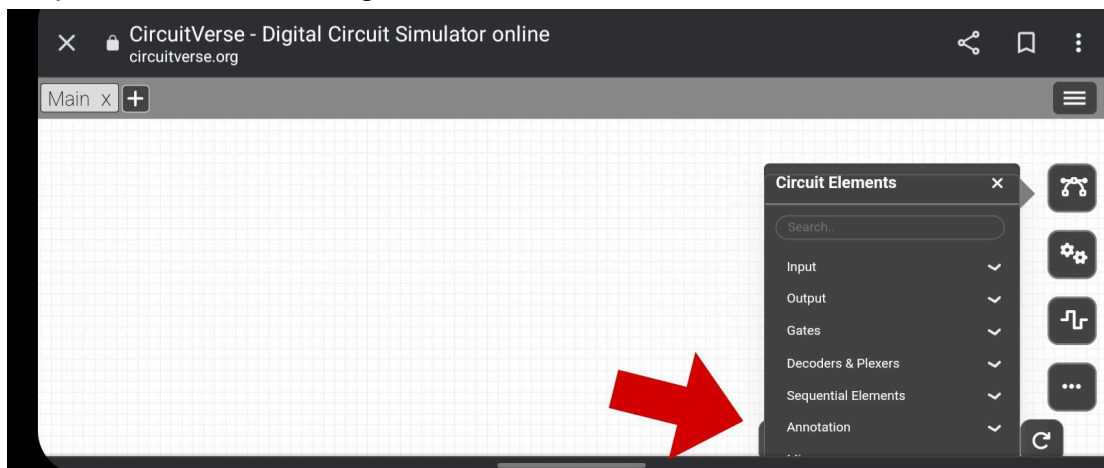2. Button going out of screen and isn't accessible by any means

3. Elements at bottom of screen touching the edge of display and hard to select

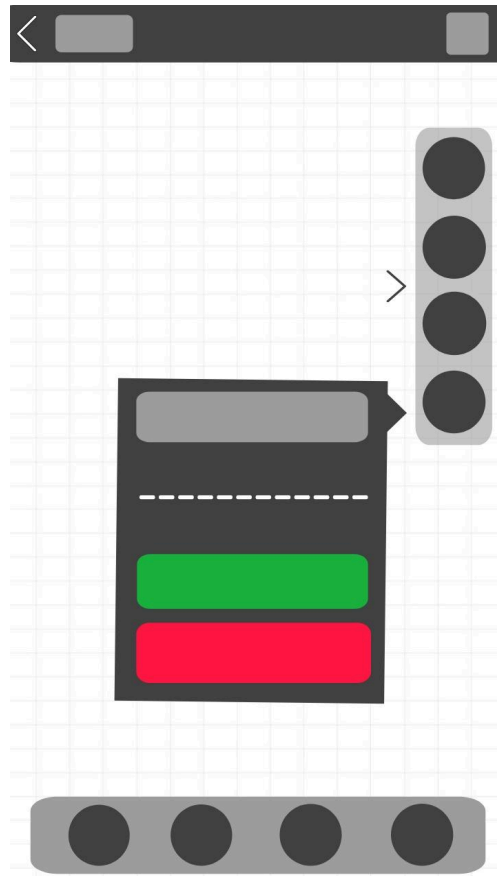4. zoom in/out and slide gestures which does not function properly on mobile devices

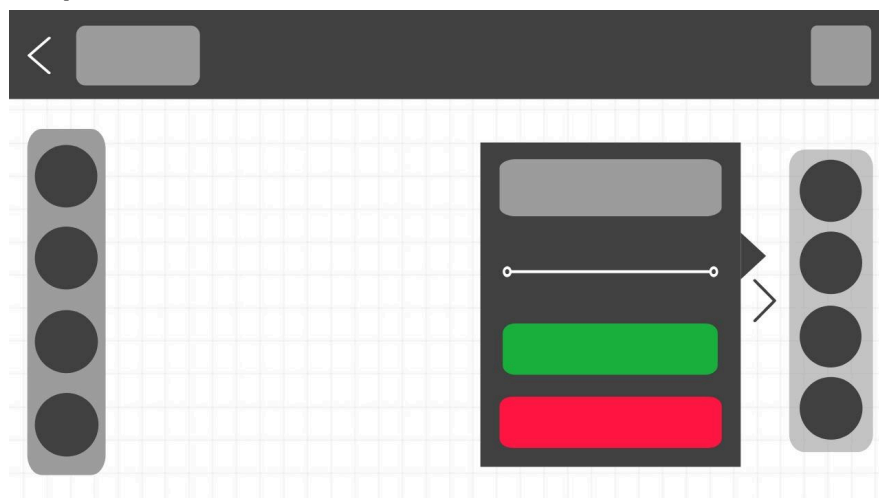5. Drop down menu covering other elements of the Circuitverse Simulator

Following are the fixes for the above mentioned bugs

1. Repositioning the menu layout to always stay in the middle of the screen, no matter which option is chosen from the elements. The triangular pointer will move up and down according to the element selected, not the whole menu layout.
   In portrait mode:-

In Landscape mode:-

2. The above solution can be implemented for the second bug as well as they are of the same type, just the area of effect is different, in first case it's a menu option and in second case a button.

3. Repositioning the elements by adjusting the distance of an element from other elements and from screen edges and align them symmetrically to improve their visibility and accessibility.
   In landscape mode:-

   In portrait mode:-

4. Improve zoom in/out and slide gestures on mobile devices

5. Redesigning the menu layout is the solution to avoid overlapping of two elements in the Circuitverse Simulator

4. Reposition and resize elements

hiding lightly used/ less important icons and highlighting frequently used ones

Resizing elements help improve their visibility and accessibility, it is difficult to interact with a small sized element on a smaller sized screen.
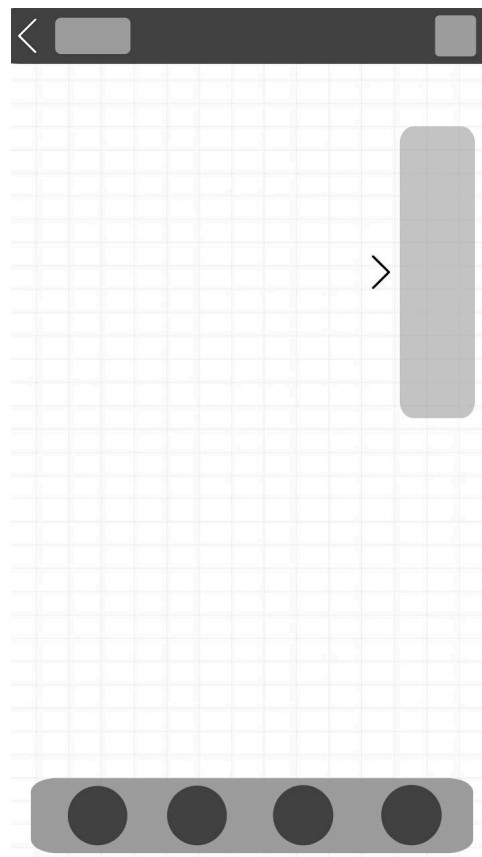Repositioning the control elements of the simulator to a mobile friendly interface, which not just makes them look good but also improves their usability. This can be achieved by the following ways and illustrations for the same are given below.
- Choosing right size for the elements according to the screen size of the device
- Positioning the elements such that they do not overlap or collide with other elements and also taking in to consideration their accessibility
- Design layout for the elements in order to improve the appearance of the simulator and efficient usage of screen size
- Using drawer menu to hide less frequently used elements to make screen available for the actual circuit.
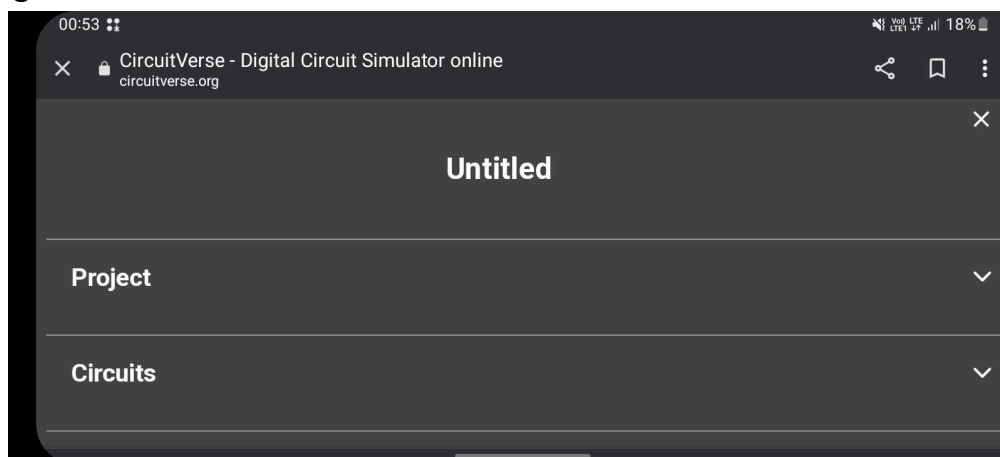
In Landscape mode:-

In portrait mode:-

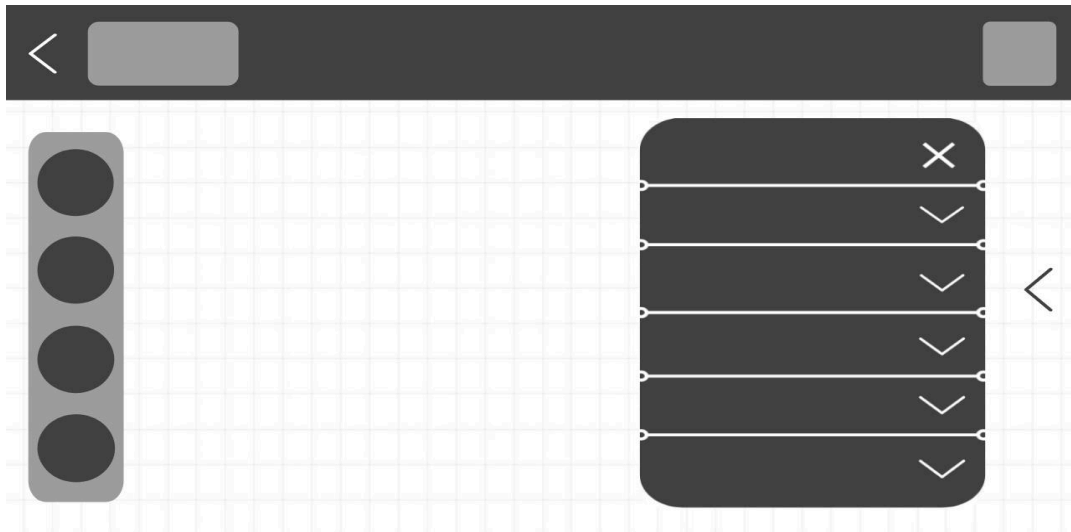## 5. Redesign menu layout to improve user experience on mobile devices

Redesigning the menu layout from scratch to improve its visibility, accessibility and overall user experience. Illustrations for the same are given below.
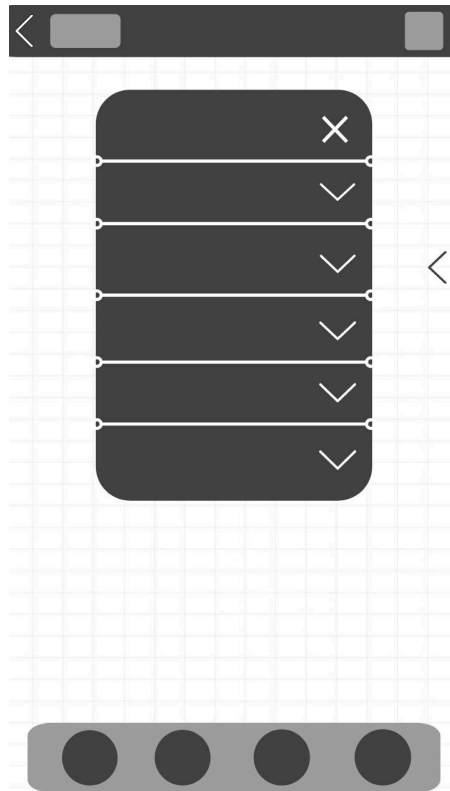
Existing:-

Proposed:-

In Landscape mode:-

In portrait mode:-

By implementing the above mentioned solutions the engagement and user experience of the Circuitverse logic design simulator can be enhanced.

Thank You!