



# Smart Switchboard for Modern Living

A multi-functional system designed to enhance convenience, efficiency, and automation in residential and commercial spaces.

Rahul Siddharth-(ME22B1026)  
Sushmith-((ME22B1044)  
Puneeth-(EC22B1042)  
Jaya surya-(ME22B2015)  
Jayanth-(EC22B10598)

## Problem Statement

Traditional switchboards:

- Require manual operation
- Lack smart control and automation
- Lead to energy wastage and inconvenience
- Don't include integrated charging or storage

## Objectives

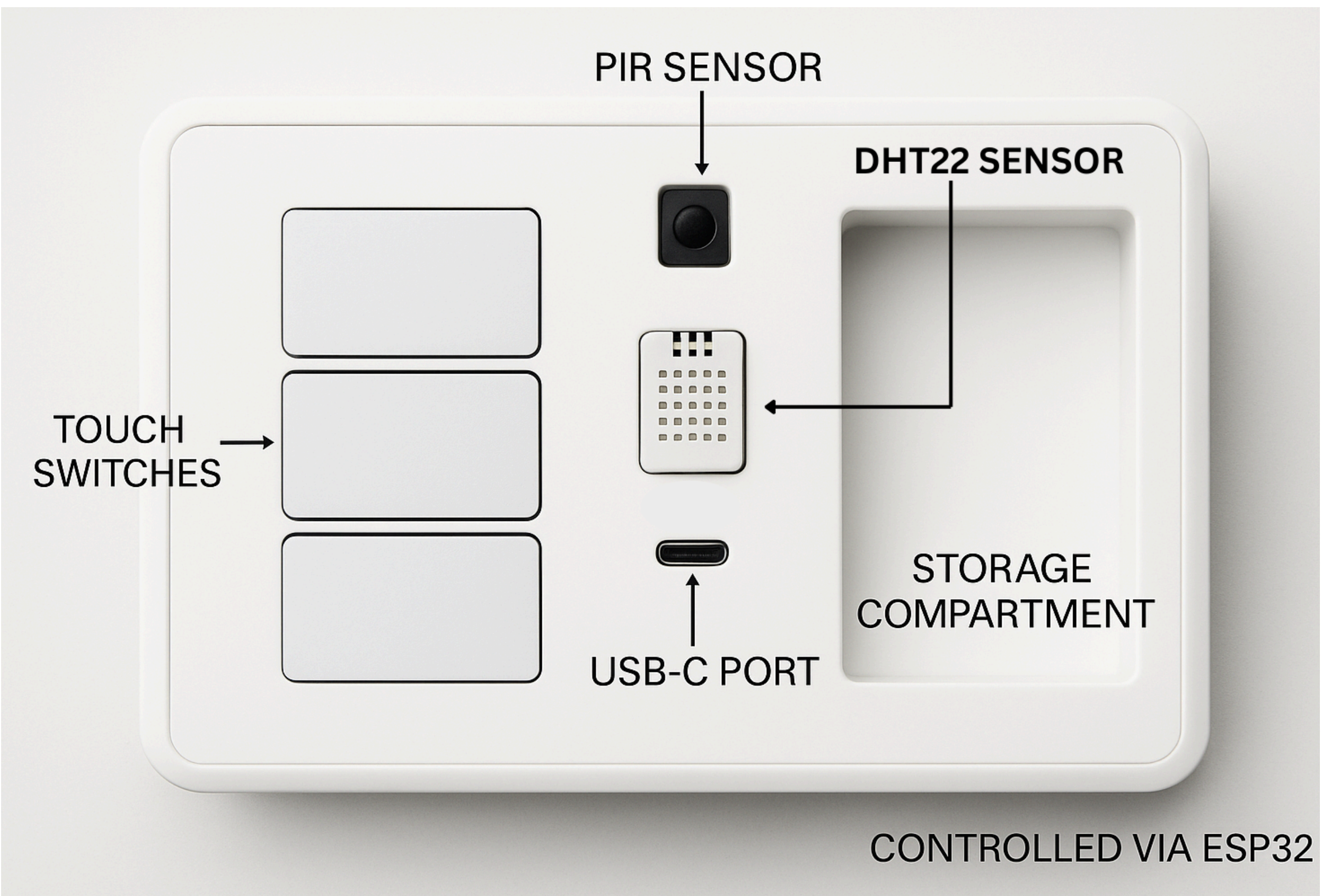
- Enable touch-sensitive smart switching
- Integrate C-type charging port
- Include motion sensing for automation
- Provide fan speed regulation
- Add built-in storage to switchboard design

## Assumptions

- Users are familiar with smart home technologies
- Integration with existing home wiring is feasible
- Basic IoT setup is available for testing
- PIR sensor detects only human motion (no pets)

## Conceptual Design

- Touch switches using capacitive sensing
- PIR sensor for motion-based automation
- DHT22 sensor for temperature-based fan speed control
- USB-C port embedded into the board
- Storage compartment for phones, keys
- Controlled via ESP32 microcontroller



## BILL OF MATERIALS

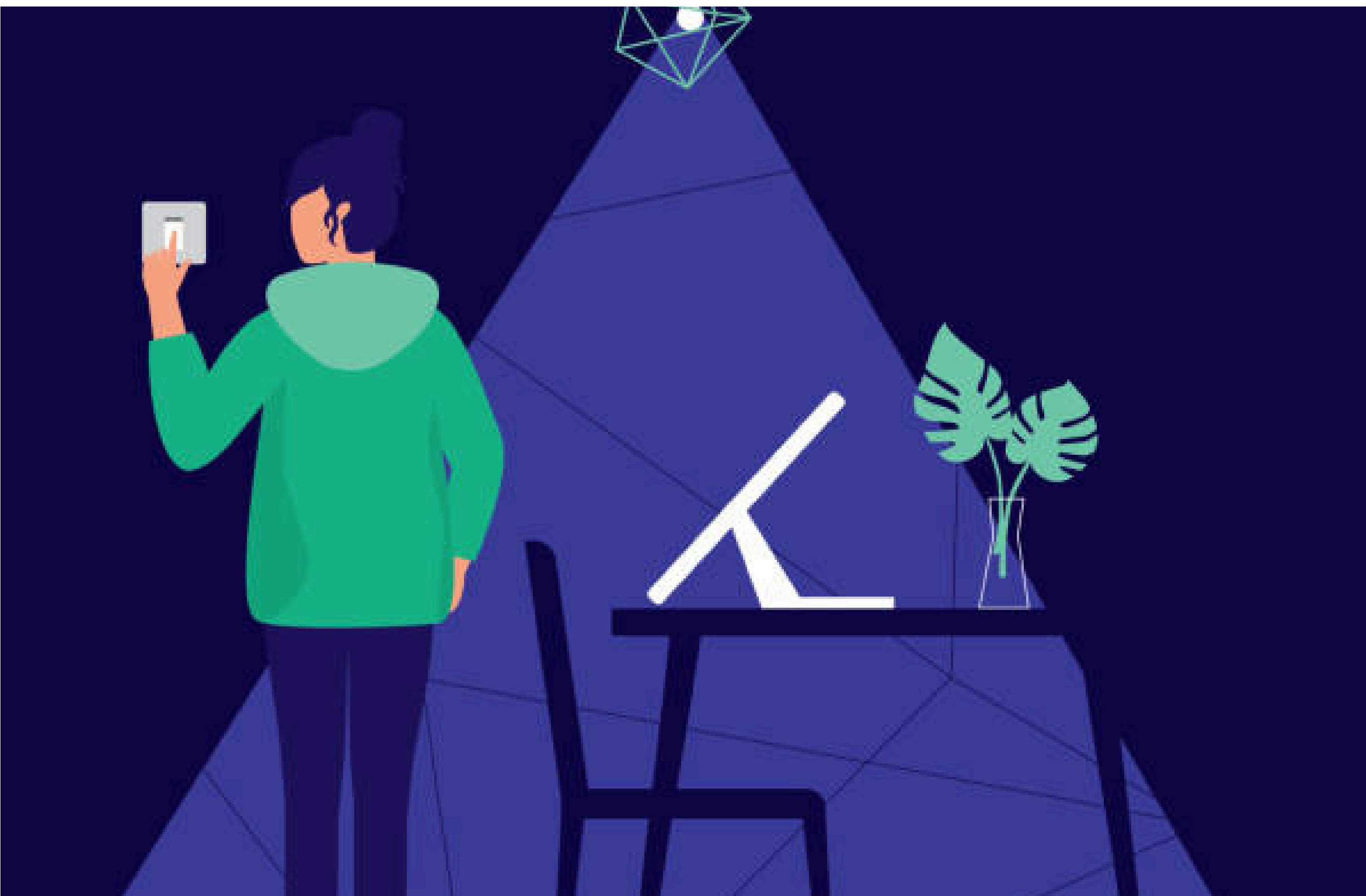
Components	Cost
PIR Motion sensor	60
ESP32	400
DHT22 Sensor	121
USB Type A break down	60
SMPS Power Supply	232
Touch Sensiive Switch Modules	50
Jumper Wires	190
Total	1113

## Prototype

- Working prototype tested in a controlled environment
- Motion sensor automates lights/fans
- Fan adjusts based on room temperature
- Charging port tested with real devices
- Storage compartment integrated in design

## Outcomes & Inferences

- Enhanced user convenience and energy savings
- Modular design promotes customization
- Future-ready for ML-based fan control
- Positive feedback on usability and utility



## Future Enhancements

- Implementation of Decision Trees for Control Logic
- Use of Radium Stickers for Better Visibility
- Updating the CAD model
- Integrating IoT with the switch board
- Increased Power Supply for Mobile Charging

## References

- EFY Projects on Touch Switchboards
- Wokwi Simulation:  
<https://wokwi.com/projects/374747084695793665>