

# Smart Switch using Arduino

FROM FLIP TO SMART: REVOLUTIONIZING CONTROL WITH ARDUINO

*Effortless Control, Smarter Living with Arduino.*

## The Survey and Identification of the Problem

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### Visit in Group

We went to nearby shops and rather small road side shacks to check what electrical appliances they employed. This is especially in regard to the regular switch operations of a systems.

### Identification of the Issue

Nonetheless from our field visit, we have managed to discover some challenges:

#### Torment

Lights and fans are switched on and off manually, which is a pain especially working in a multi-switch environment.

Not only are they almost always out of the question, but the cases of the vents are usually located in hotels and food stalls ways that it is almost impossible to make them user friendly.

#### Wastage of Energy

There are times when due to negligence, people leave the fans and lights on, which is a sheer wanton use of energy and ultimately more bills to pay.

#### Price

commercial smart home systems are designed in a way which makes it impossible for small organizations to implement hence takes away the automation aspect.

# Analysis and Selection

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## Problem Analysis

We assessed the occurrence and the intensity of the existing problems among local businesses and consumers. Manual switch operation was one of the issues identified as highly inconvenient due to its frequent waste of energy and the hindrance of operations. For small business owners just starting out, this was an even greater drawback since such systems of automation came with a cost that they could not incur. This made them incur unnecessary costs on their operations while not providing good service to their clients.

## Problem Selection

We opted on two problems:

1. The difficulties evoked by the manual operation of the switch-hardware that is managed remotely will be provided.
2. Switch off forgetfulness - forgetfulness in switching off causes treatable energy consumption habits that can be avoided.

These problems were accepted since they affect a large number of consumers and would be reasonable, easy and energy saving.

## The Solution

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### Product Design

That is why we propose a smart switch system in which the users would be able to operate their home electrical devices both by the use of a remote and through the web server. This system will:

1. Allow random switches to be operated from a distance through the help of a small remote.
2. Let the switches be controlled over a web-based server which can be operated using a mobile phone or a computer from anywhere.
3. Add a smart feature which saves power by turning off appliances after certain time.
4. Make sure the design is low cost and easy to install, suitable for end users and small businesses.

## Technical Specifications

### Arduino-controlled

The system will incorporate switching operations using an Arduino microcontroller.

## Wi-Fi Module

To control the switches via the web, connecting them to the internet requires a Wi-Fi module.

## Relays

High-voltage electrical devices are protected from mechanical danger by using control mechanisms.

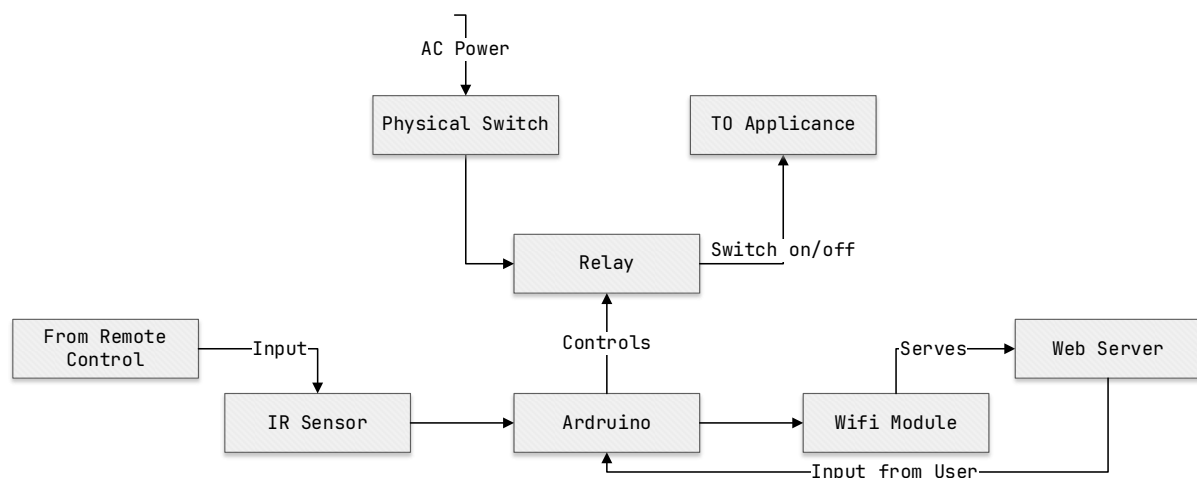
## Website Interface

An interactive web interface that allows users to manage the operations of the switches.

## Concept Sketch

The system is meant to have two control interfaces:

1. **Remote Control:** The switches can be controlled via a smaller hand-held remote unit substituting the need to go to the switchboard.
2. **Web Server:** A local web interface will enable users to use their mobile phones to control the switch. On accessing the webserver, a user is able to turn switches on and off by just clicking on them.



## Report Presentation

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### Introduction

The purpose of this report is to provide the reengineering of the conventional switch System to a smart switch System which allows remote control and web-based management of the switches.

### Methodology

We undertook a field study of the local shops and small hotels looking at the way they use traditional switches and even the problems users

encounter. Having that information, we came up with the problem and a proposition which included remote control and a web server for reasons of practicality and practical energy consumption.

## Findings

The dominant issues identified were the manual mode of switching on and off the switch and energy loss. Our approach takes a different path to solve these concerns by lowering the need to use the switches from their original positions.

## Conclusion

The smart switch system we designed is affordable and practical for use in a household as well as in small businesses, thereby making the use of the system comfortable and promotes energy conservation.