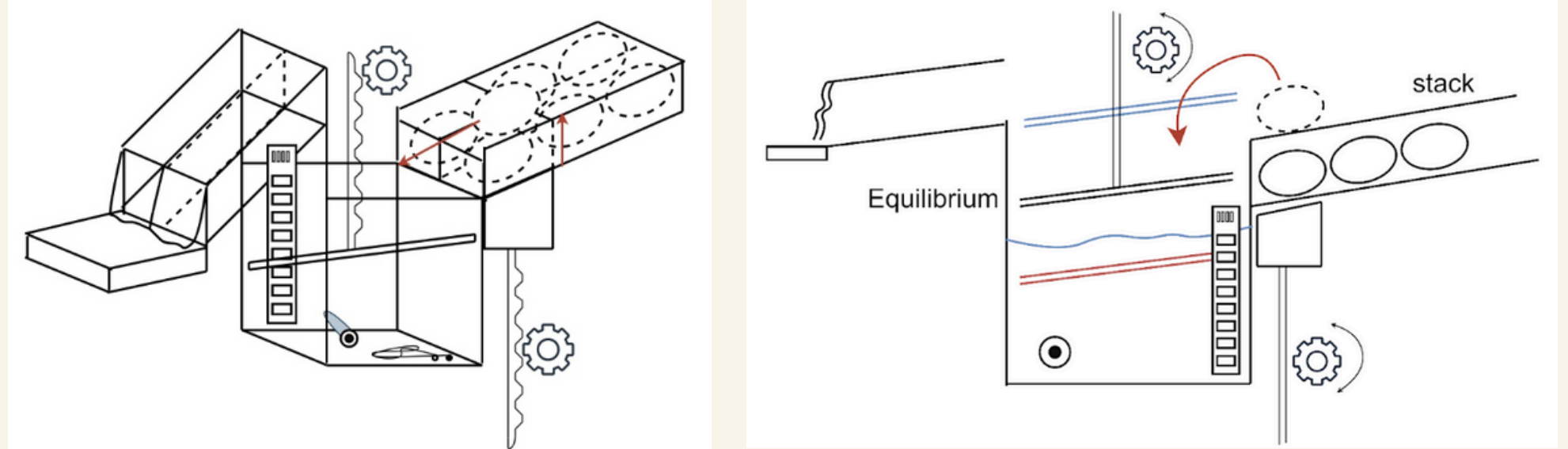


# AUTOMATIC BOILED EGG VENDING MACHINE

## 1 BACKGROUND AND INTRODUCTION

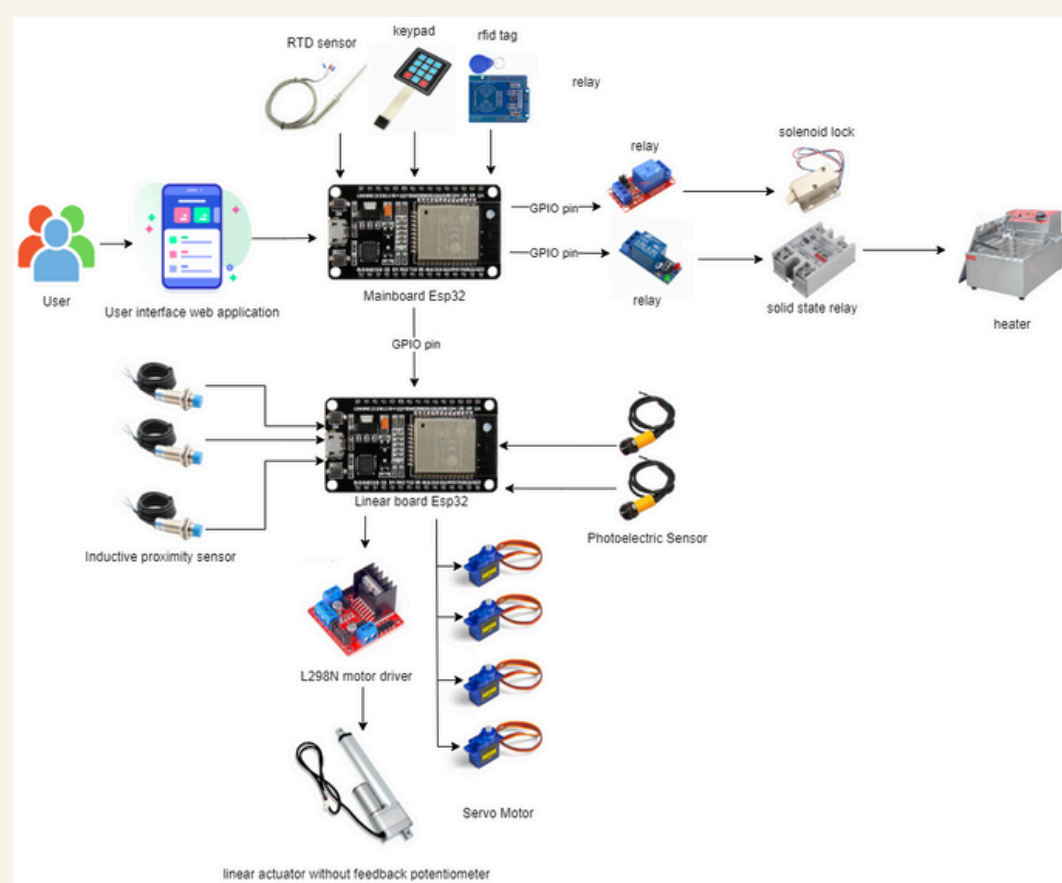
When we talk about food that is full of nutrients for people of all ages and easy to eat, the thing that comes to mind is an egg. Whether kids or adults, they have all eaten eggs once in their lives. Eggs are a basic food that can be cooked in many ways and are filled with proteins and essential amino acids, yet egg consumption in Thailand lags behind other countries, with only 255 eggs per person annually. Boiled eggs are a convenient and healthy option, but cooking them can be time-consuming for busy individuals. Purchasing pre-boiled eggs often means settling for cold eggs that can't be reheated safely. This project aims to address this issue by offering freshly boiled eggs to consumers, providing a convenient solution for those seeking a quick, nutritious meal option.

## 2 HARDWARE DESIGN (3:3)

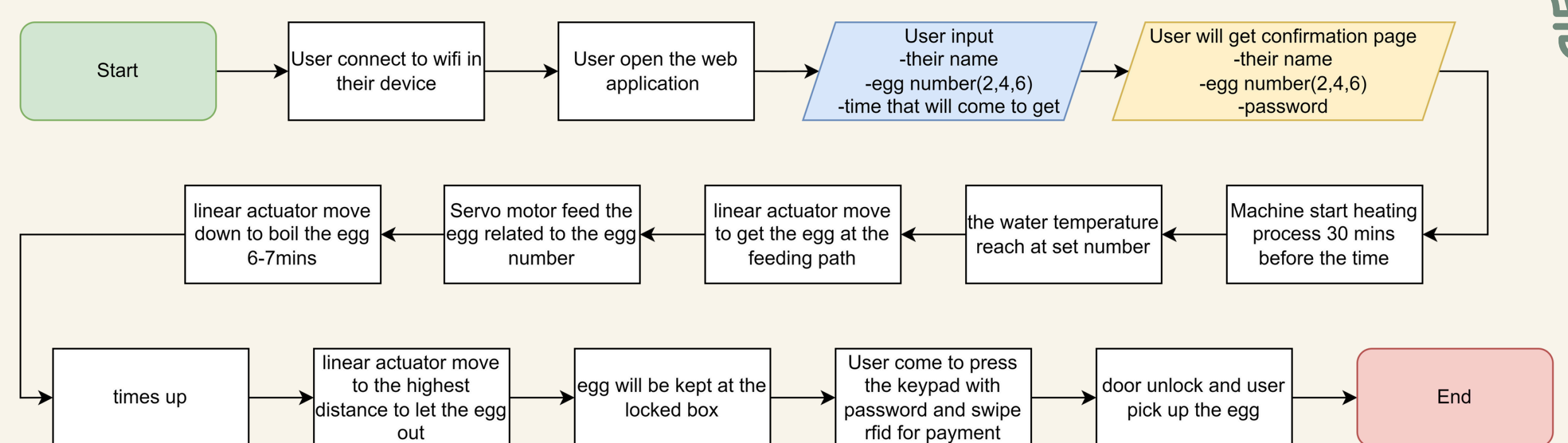


The design of the machine has 3 hardware parts. Input inclined path, Boiler and Output inclined path. The egg movement will use linear actuator attached with the colander

## 3 SYSTEM OVERVIEW



The position movement of the colander has 3 position. The eggs that are stored in the incline path will be feeded by the servo motor after the heating process is working, the egg that exists at the end of the path will slide into the colander at equilibrium position. The colander will get pushed by linear actuator from its equilibrium deep into the pot and start boiled (boiling position). After time up, linear actuator will pull the colander up to reach the exit path (exit position), and the egg will slide into the output inclined path at the exit.

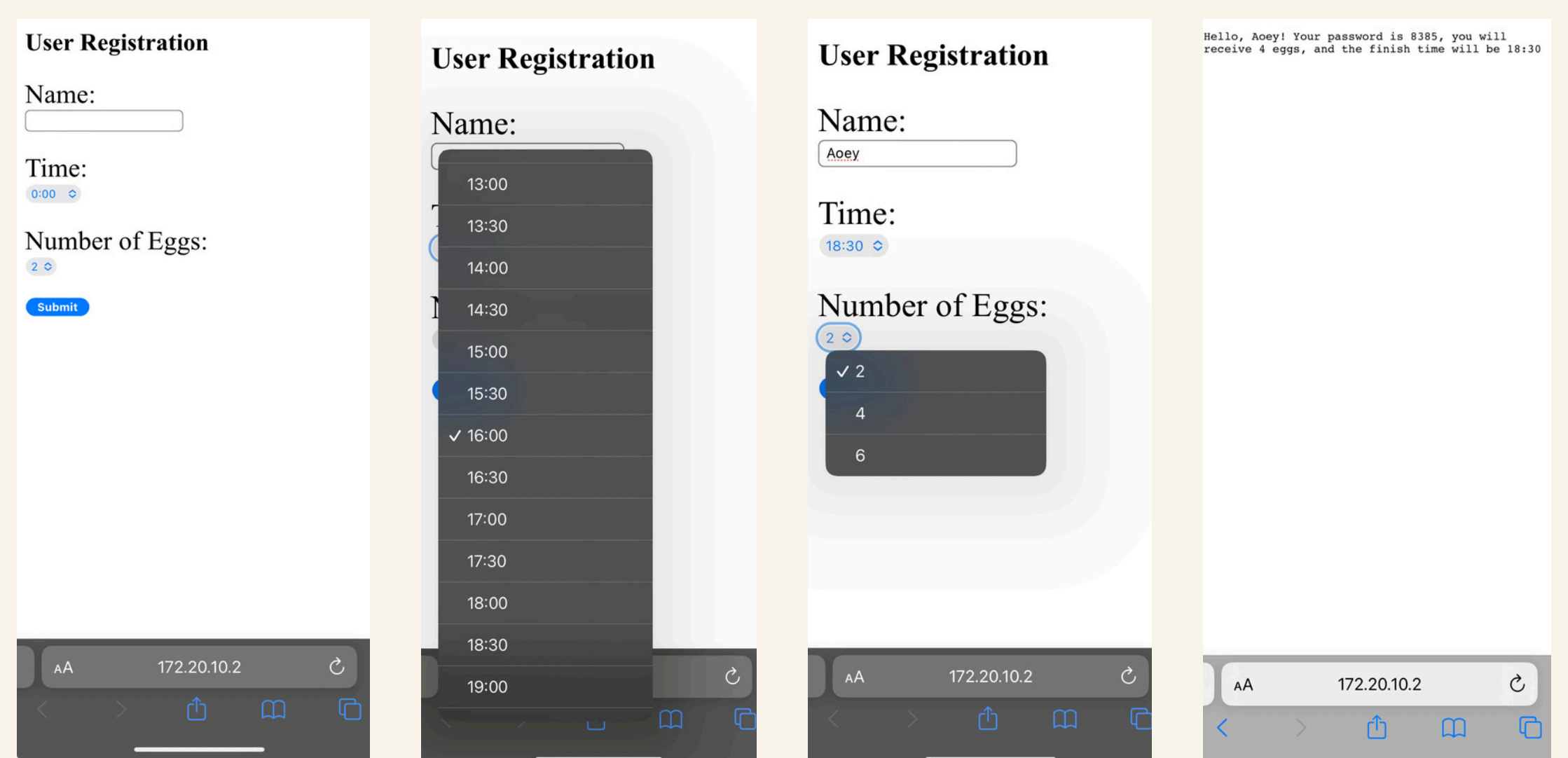


In our project use 2 boards including  
1. Mainboard  
2. Linear actuator board  
Mainboard is responsible for receiving input from user through the web application, and handle the heating process part and the output path that related to the authorization and password. Linear actuator board will handle the movement that is the three position of the function using linear actuator and inductive proximity sensor. Also the egg feeding part that use servo motor and photoelectric sensor.

User have to connect to the Wi-Fi in their device. Please noted that Wi-Fi have to be the same as our system, then users open the Web application, type their name, egg number, and a time that will come to get it. After that they will have a confirmation page that include their name the egg number and the password, then machine start heating process 30 minutes before the time, after the water temperature reaches the set number, linear actuator will move to get the egg at the feeding path. Then, servo motor feed the egg related to the egg number. Linear actuator, moved down to boil the egg around 6 to 7 minutes. After times up, linear actuator move to the highest distance to let the egg out. The egg will be kept at the locked box. Before the picking time users come to press the keypad with given password and swipe RFID for payment, finally the door is unlocked and users pick up the egg.

Customers can access the website by connecting to the same WiFi as the main board and using the main board IP address to enter the login page. The header of the login page is "User Registration," and the sub header is the data request from the customer, which is the customer name, pick-up time, and number of eggs they preferred. The pick-up time option is a drop-down list that contains the time to be 30 minutes apart. Customers need to input the time to be at least 30 minutes before the current time, as the eggs need at least 30 minutes to prepare, and the website will assume that the order is for the next day. For the egg number's option, there are 3 choices: 2, 4, and 6. After the submit button is pressed, it will show the customer data including name, generated password, egg-number, and pick up time.

## 4 USER INTERFACE / WEB APPLICATION



## 5 CONCLUSION

The AUTOMATIC BOILED EGG VENDING MACHINE is a device for selling fresh boiled eggs using a webpage to order and simulate payment using RFID by employing two ESP32 boards to manage every internal function. We had to modify a lot of the hardware to match our needs, such as turning the deep fryer into a boiler, changing the actuator used to input the egg into four servos, mounting the actuator from the bottom up, and building a sturdy frame to support the system. Everything mentioned above is the process, hardware design, and software web application for user interface used to build this ABEV machine.