CHAPTER 4
ANALYSIS AND DESIGN

4.1 Analysis

The project uses NodeMcu Esp8266 microcontroller as the other control center of the device. Other devices used are Motor Servo, Ultrasonic Sensor HC-SR04, and Real-Time Clock (RTC) DS3231. Ultrasonic Sensor HC-SR04 is used to read the distance between the feeds to the HC-SR04 Ultrasonic Sensor. Servo motor functioned as a valve to close and open the main tank of feed. Real-Time Clock (RTC) DS3231 function to get data in the form of year, month, date, hour, minute, and second.

4.2 Desain

4.2.1 Flowchart

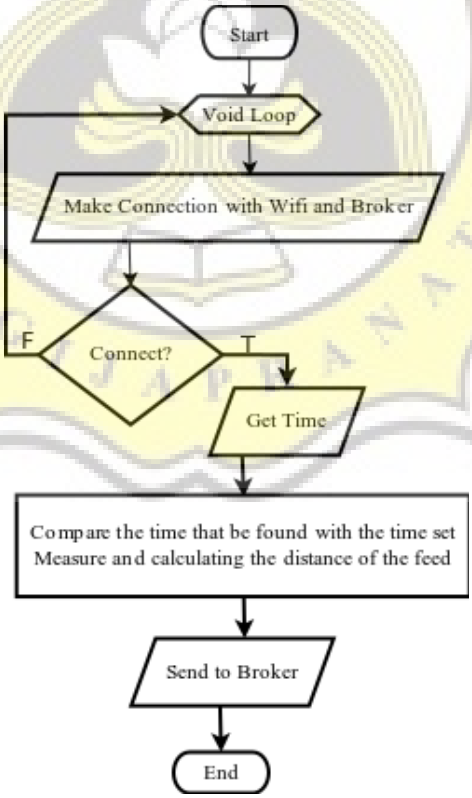

Figure 5: Flowcart

This program starts from NodeMcu. NodeMcu will connect with wifi and broker. If NodeMcu has been connected to wifi and broker, then NodeMcu will give command to RTC DS3231 to get time. After obtaining time data, then the program will compare the time in can with the time already set in the program. If the clock at the time obtained from RTC DS3231 <= 9 and> = 18, then the program will continue by reading the distance between the feed and the ultrasonic sensor. If the distance is read> = 10, then the program will send a signal to the servo to move closer or move 90°, vice versa if the distance read by ultrasonic sensor <= 10, then program will send signal to servo to move open or move 180°. Then if the clock at the time is allowed from RTC DS3231> 9 and <18, even if the distance is read> = 10 or <= 10, then the servo will remain in closing position or at 90 ° position. Data readings from ultrasonic sensors will be continuously uploaded to the broker once every minute.

4.2.2 Design Schematic

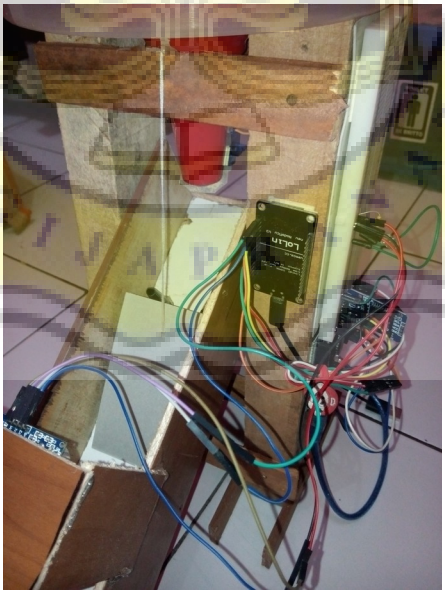

Figure 6: Design Schematic

Information :

The NodeMcu pin used in this project is 6 pins. That is D0, D2, D3, D4, D5, D6, 3V, GND. Writers add arduino uno device as power supply. Arduino uno pin which used in this project is just 5V pin and GND. HC-SR04 is using 4 pin. That is VCC(5V), GND, Trig, and Echo. RTC DS3231 is using 4 pin. That is VCC(5V), GND, SDA, SCL. Servo is use 3 pin. That is VCC(3V), GND, and PWM. Led is use 2 pin. That is D6 and GND. The assembly of this machine as follow :

D0 – Trig (Feed level).

D2 – Echo (Feed level).

D3 – SDA .

D4 – SCL .

D5 – PWM.

D6 – Led (+).

VCC(3v) – VCC Servo.

GND(NodeMcu) – GND Servo.

VCC(5v) – BreadBoard +.

GND(Uno) – BreadBoard -.