CHAPTER 3
RESEARCH METHODOLOGY

The author completes this project through the following steps:

1. Prepare the device

The author prepares the required devices, namely NodeMcu Microcontroller, Servo Motor, Ultrasonic Sensor HC-SR04, Real-Time Clock (RTC) DS3231, Arduino Uno(only as power), male-female cable, and Breadboard.

2. Search for an IoT server

The author searches and creates an account at the broker to upload and store reading data from the device used.

3. Create a program

The author created a complete program to complete this project. The program starts from including all required libraries, declares variables to connect to the internet, declares variables to communicate with the broker, declares input / output variables, reads data from RTC and Ultrasonic Sensors, and determines the requirements for controlling servo motors.

4. Create feed places and pathways

After the series of devices that have been in the program can run, the authors make the feed and feed path that will be used as the distribution of feed. The author uses a jar at the top as the main feed tank, the bottom of the jar is cut and replaced with a funnel, the goal is to minimize and facilitate the delivery of feed. Furthermore the authors make the feed with a sloping position, the author uses gravity whose goal is to feed can be distributed evenly. After the feed container and feed line are finished, the
author tries to include feed into the main tank to see and ascertain whether the feed can be well distributed and not clogged in the funnel drain.

5. Assembling devices

The author began to assemble all the devices in the feed container, connect all the wires, and position the device according to their respective functions. The author puts the servo on the funnel exhaust, the purpose for opening and closing the funnel exhaust. The author assembles a place for ultrasonic sensors; the installation of ultrasonic sensors must be perpendicular to the field to be read by ultrasonic sensors. Ultrasonic sensors can obtain maximum reading if the ultrasonic sensor read surface is flat, therefore the authors add a flat field whose altitude can change according to the height of the feed.

6. Testing

The author tries the entire feeding mechanism automatically and view the distance data through the broker.