

CHAPTER 3

RESEARCH METHODOLOGY

Every process that is done must go through stages and concepts, when starting to work on this project the first thing to do is by collecting journals about how the sensor systems and methods work properly and correctly. Because each sensor has limitations and strengths in carrying out each process, every step – step that is taken must find the source website that has been verified and has already done an experiment. The first thing to do is use an Arduino uno based on ATmega328 and has 14 pins of digital output.

In the next section using dht11 sensor to measure temperature and humidity which has an analog voltage output that can be processed using microcontroller. After that add a fire sensor which is a device that is sensitive to ultraviolet radiation which is caused by a flame. After that looking for the source of coding from the website and look for a circuit of digital pins that will be used for both sensors. Next, input the dht11 sensor pin to the 3volt pin as the power voltage, pin 2 and to ground and continue with the fire sensor to the analog pin A0, 5volt and ground. After that, testing the two sensors into a closed room and open space to get different values to the dht11 sensor. Next test the flame sensor to the candle as an object from source of the fire and get the value from analog.

After running 2 different sensors to get the correct output then add a LCD with a size of 2x16 to display the program from the sensor. In this section input the ground pins, a4, a5 and 5volt for the voltage. When everything works perfectly and correctly. Arrived next using a micro SD card instead of PHP which is to store the results as a place to record all values with the following pins 11, 12, 13, cs and 5volt for all pins needed as input, and finally open file CSV from SD card and

open CSV file using Libre Calc to open all the values that were successfully recorded via micro SD. Next tidy up the file that has been saved into CSV file by adding the average value of the fire sensor and the average value of the dht11 sensor, and adding the distance each time the experiment starts detecting temperature and humidity and fire. At the end it adds a graphic of the sensor value and the dht11 distance and also the fire sensor, after that it adds graphics to all sensors and the distance

