

CHAPTER 4

ANALYSIS AND DESIGN

4.1 Analysis

This Project is done to make the tomato measuring device based on its weight, which was grouped into three groups. There are big tomatoes, medium tomatoes and small tomatoes. The required components in this project are:

1. Arduino UNO
2. Breadboard
3. Motor Servo (MGR 955)
4. Load Cell
5. Module HX711
6. Module SD Card
7. Mikro SD
8. Module RTC (DS3231)
9. Step Down
10. Kabel Jumper

This Project uses Arduino UNO as a microcontroller. In this project, to classify tomatoes by measuring the weight of tomatoes. Load Cell is a sensor that able to measure the weight value, so this sensor can be used to measure the weight of tomatoes. RTC is the necessary module to provide time information. Time can be in seconds, minutes, hours, days, months and years.

This Project uses Arduino programming language. SD Card module is a module to access Micro SD as a data storage media in TXT format. This Project also uses

PHP LocalHost programming language to display data from the data collection results stored in the Micro SD in txt format.

4.2 Desain

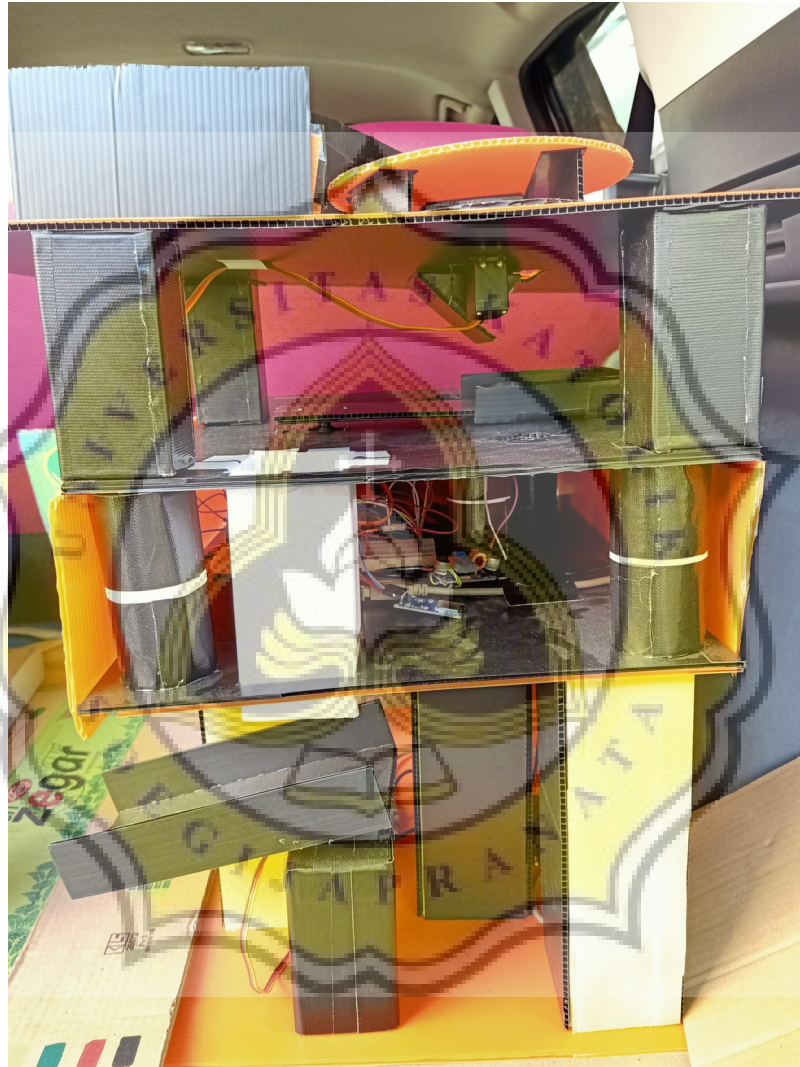
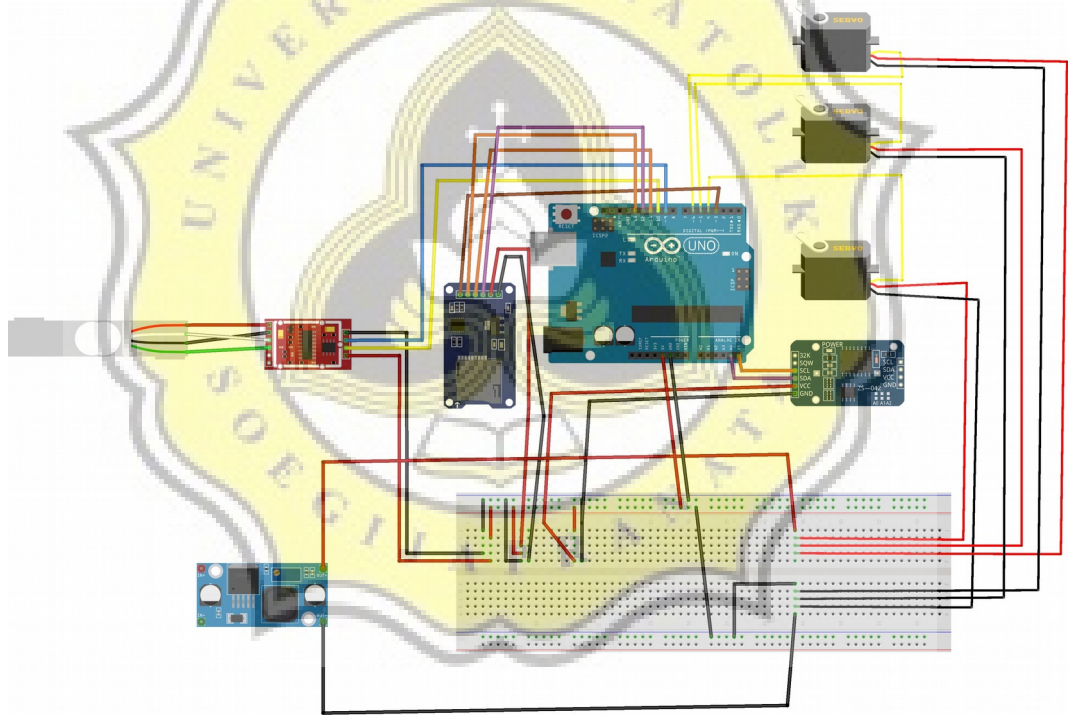


Illustration 4.1: device design

This device design consists of four parts, the top, two middle parts and the bottom. The upper part can also be called the first floor in this device that serves as a place to drop tomatoes automatically from the first floor to the second floor with the servo. The two central parts can also be called the second and third floor. In this second floor device serves as a place to place the tomatoes that measures

the weight with the Load Cell three times to get the average weight of the tomato, is automatically called with the servo, after obtaining An automatic average of the servo will throw it from the second floor to the 4th floor. The third floor in this device contains Load Cell to weigh tomatoes, RTC module to get information about the time, module SD Card as data storage in Micro SD in txt format and Step Down as power for the three servo pieces. The bottom or can be called the fourth floor serves as a tomato separator automatically by using the servo based on weight after the known weight value of tomatoes.



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Illustration 4.2: arduino scheme

From the scheme above, this project uses Arduino UNO, Breadboard, Load Cell, module HX711, RTC DS3231, SD Card module, servo motor and Step Down.

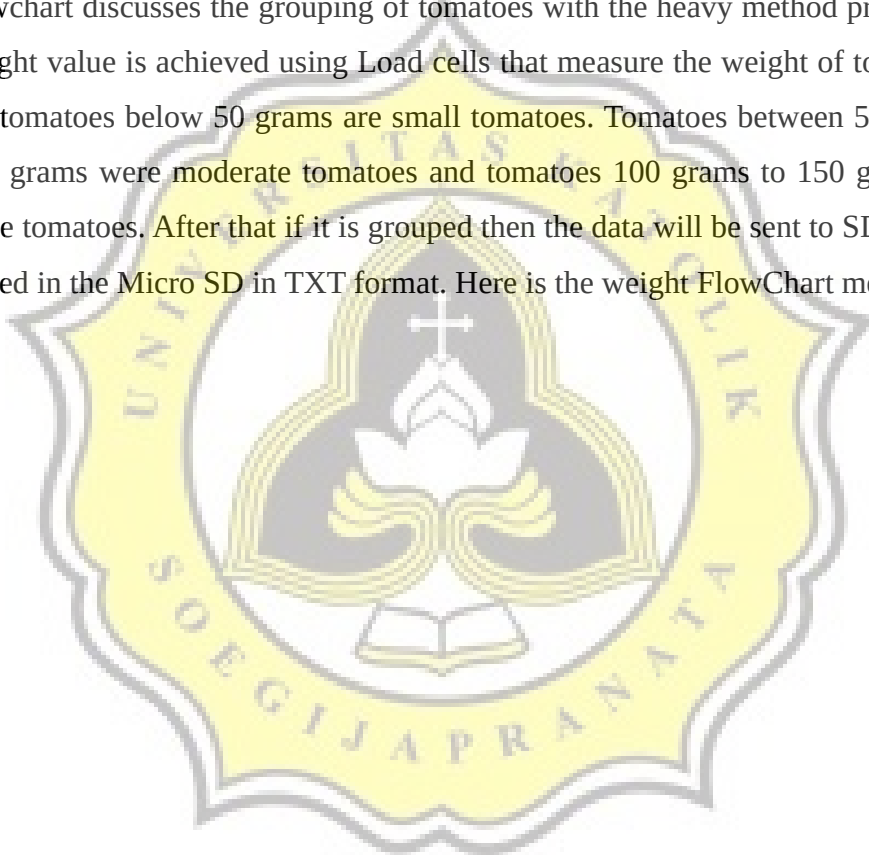
The Load Cell serves to measure the weight of tomatoes. The results of the Load Cell readings are gram units. Module HX711 serves as a reading amplifier from Load Cell. RTC serves to get time information. Module SD Card as a storage media datadalam txt format form. Servo serves to regulate the tomato motion. This Project uses an adapter with an output of 12 V, hence the adapter is required to connect the Step Down to reduce the voltage from 12v to 5 V.



Illustration 4.3: Tomatoes

This project uses tomatoes for the training of data that has weight range from the range of 30 grams to 120 grams. Data is obtained as a base value of large tomatoes, moderate tomatoes and small tomatoes.

In this project grouping tomatoes uses weight value method. The following flowchart discusses the grouping of tomatoes with the heavy method process. The weight value is achieved using Load cells that measure the weight of tomatoes. If the tomatoes below 50 grams are small tomatoes. Tomatoes between 50 grams to 100 grams were moderate tomatoes and tomatoes 100 grams to 150 grams were large tomatoes. After that if it is grouped then the data will be sent to SD Card and stored in the Micro SD in TXT format. Here is the weight FlowChart method.



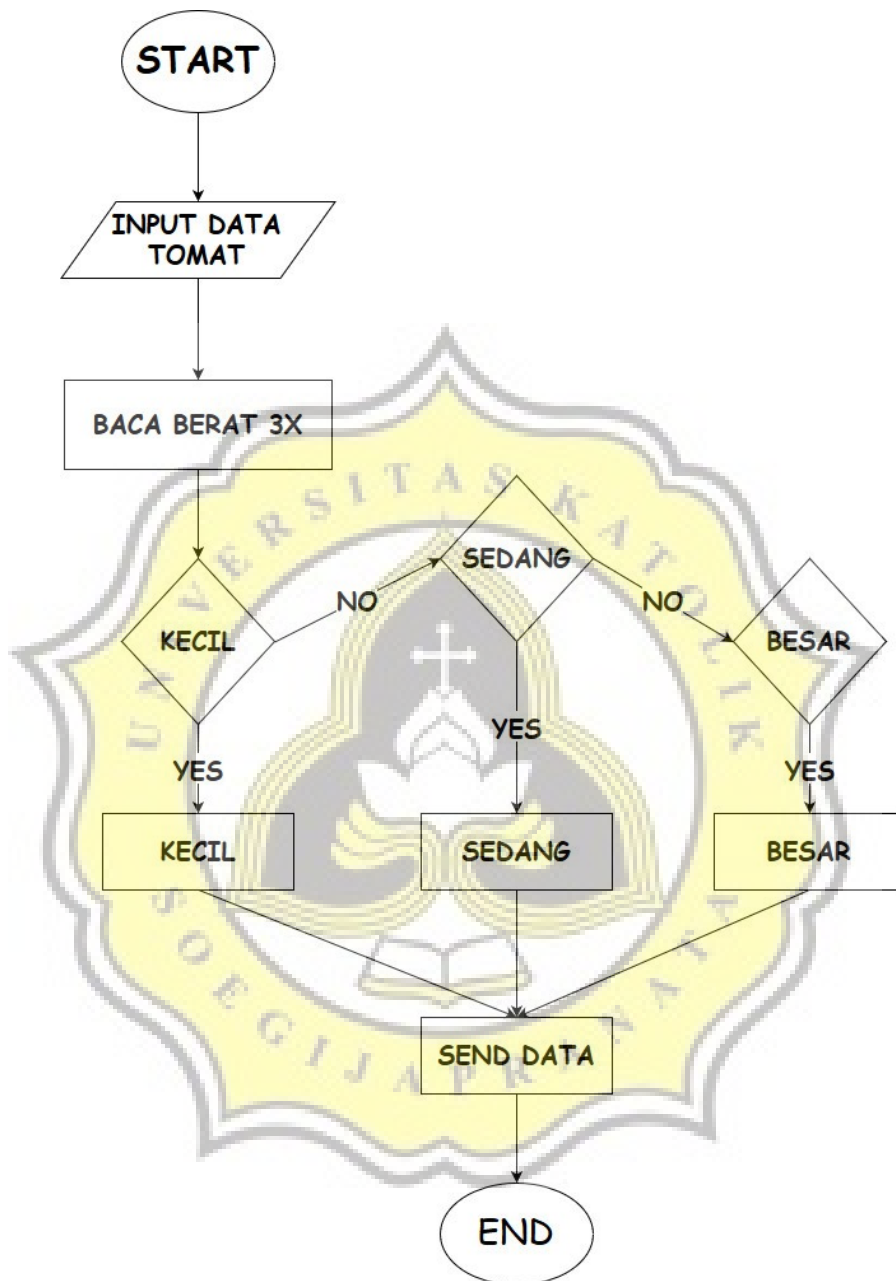


Illustration 4.4: flow chart