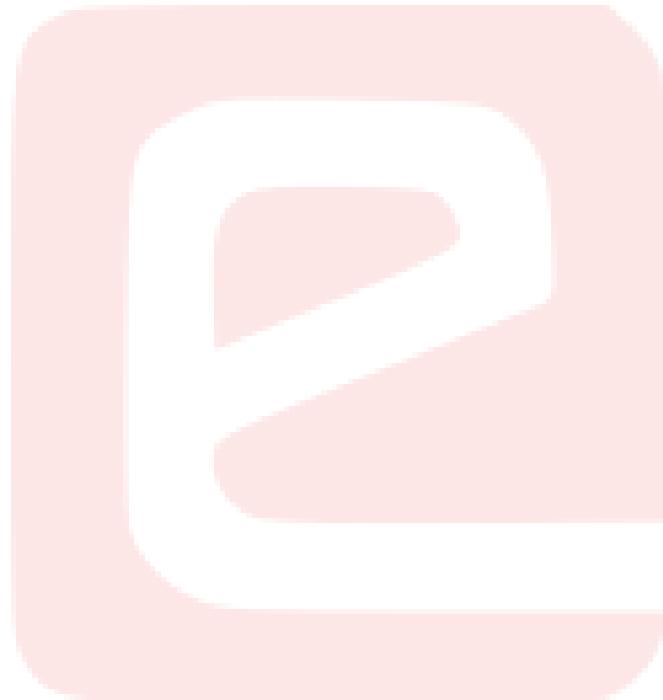


eYSIP2016

FARM PRODUCE: LOGGING AND MONITORING



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Duration of Internship: 27/05/2016 – 10/07/2016

2016, e-Yantra Publication

Farm Produce: Logging And Monitoring

Abstract

This project logs crop data in a green house to reduce manual labour. Essentially, it is a weighing machine connected to Internet.

A weighing machine will be delivered to user which can measure weight of crop by using load cell. User can input information related to crop via keypad. User will be assisted by continuous messages on screen. After successful data entry the data will automatically pushed to database. Local people can also take advantage of crop production by placing order through e-commerce website after filling details.

Completion Status

The project is successfully completed providing "weighing platform, screen, keypad, e-commerce website, admin-panel and user manual."

1.1 Hardware Parts

- Hardware parts
 - Load cell
 - 20x4 LCD
 - 4x4 Keypad
 - Raspberry pi 2 Model B
 - LM2596 step-down voltage regulator
 - HX711(ADC amplifier)
 - USB Camera

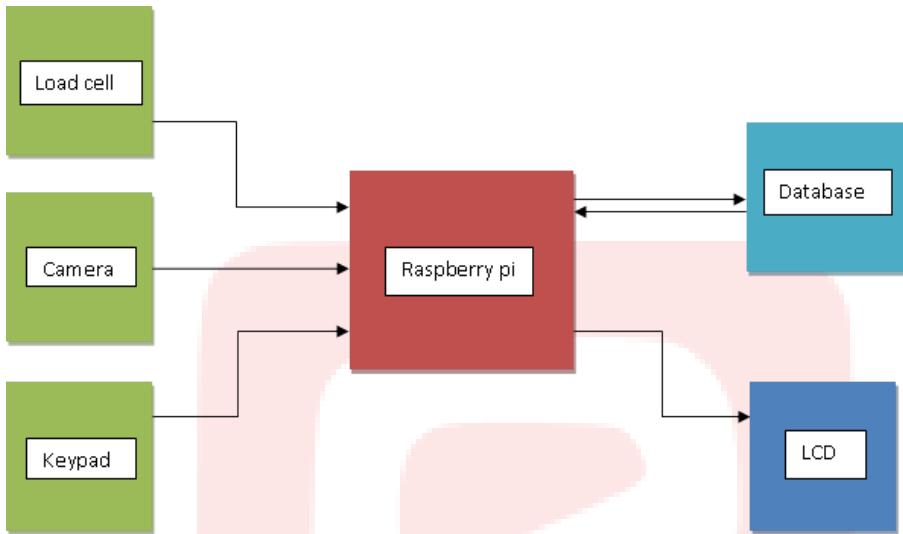
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- DC Adapter
 - Enclosure to hold all parts
- Detail of each hardware:
 - [HX711 ADC Amplifier](#)
 - [Load cell CZL601](#)
 - [Step down voltage regulator](#)
 - [20x4 LCD](#)
 - [Membrane Keypad](#)
 - [Raspberry pi 2 Model B](#)
 - [4x4 Keypad](#)

1.2 Software Used

- List of software used
 - win32 disk imager
 - Raspbian wheezy
 - Notepad++
 - Local server(xampp apache)
 - Mysql(xampp)
 - Dfptrace
 - Corel draw
 - Autodesk Autocad
 - Solidworks
 - Atom text editor
 - Opencart framework
- link of software:
 - [win32 disk imager](#)
 - [Raspbian OS](#)
 - [Xampp](#)
 - [Notepad++](#)
 - [Dfptrace](#)

1.3 Assembly Of Hardware

Block Diagram



Connection Diagram

Raspberry Pi 3 GPIO Header			
Pin#	NAME	NAME	Pin#
01	3.3v DC Power	DC Power 5v	02
03	GPIO02 (SDA1 , I ² C)	DC Power 5v	04
05	GPIO03 (SCL1 , I ² C)	Ground	06
07	GPIO04 (GPIO_GCLK)	(TXD0) GPIO14	08
09	Ground	(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)	(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)	Ground	14
15	GPIO22 (GPIO_GEN3)	(GPIO_GEN4) GPIO23	16
17	3.3v DC Power	(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)	Ground	20
21	GPIO09 (SPI_MISO)	(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)	(SPI_CE0_N) GPIO08	24
25	Ground	(SPI_CE1_N) GPIO07	26
27	ID_SD (I ² C ID EEPROM)	I ² C ID EEPROM ID_SC	28
29	GPIO05	Ground	30
31	GPIO06	GPIO12	32
33	GPIO13	Ground	34
35	GPIO19	GPIO16	36
37	GPIO26	GPIO20	38
39	Ground	GPIO21	40

Rev. 2
29/02/2016 www.element14.com/RaspberryPi



Figure 1.2:
Keypad pin-out

Figure 1.1: Rpi
pin-out

Pin No	Name
1	Vss
2	Vdd
3	Vee
4	RS
5	R/W
6	E
7	D0
8	D1
9	D2
10	D3
11	D4
12	D5
13	D6
14	D7

Figure 1.3: LCD pin-out

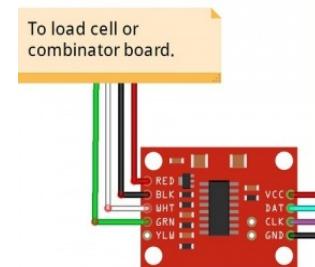


Figure 1.4: load cell pin-out

1.3.1 Schematic Interface Between Modules

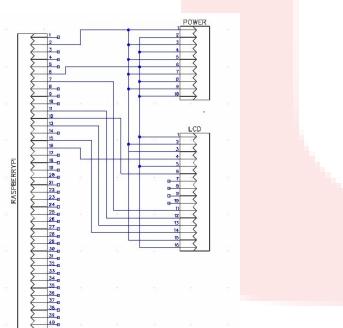


Figure 1.5: Rpi, power and LCD

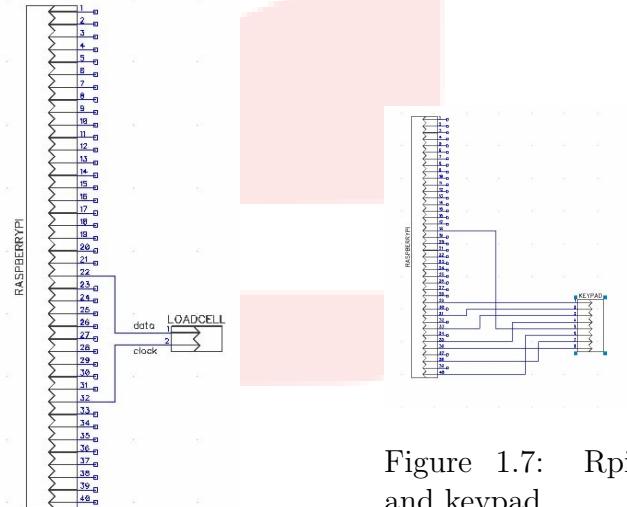


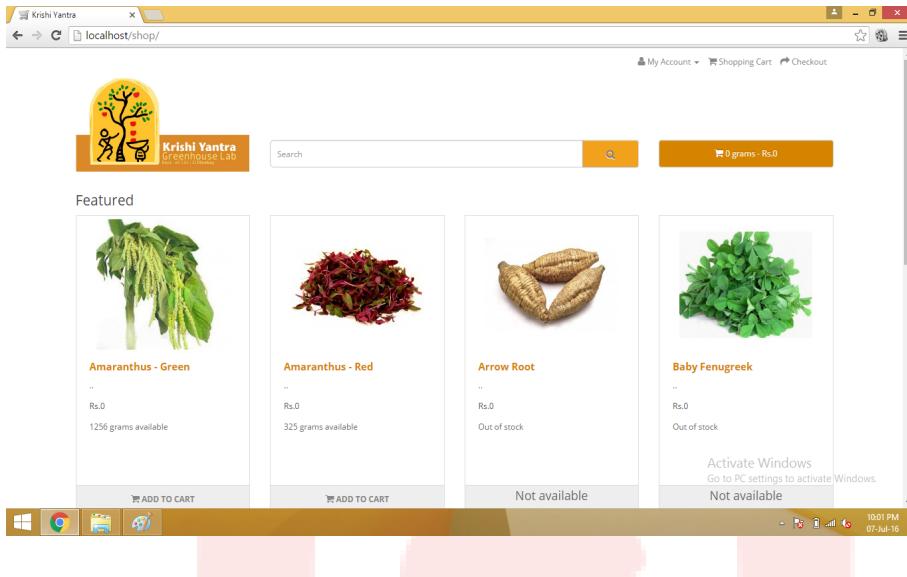
Figure 1.6: Rpi and Load cell

Figure 1.7: Rpi and keypad

1.4 Software And Code

[Github link](#)

e-Commerce website

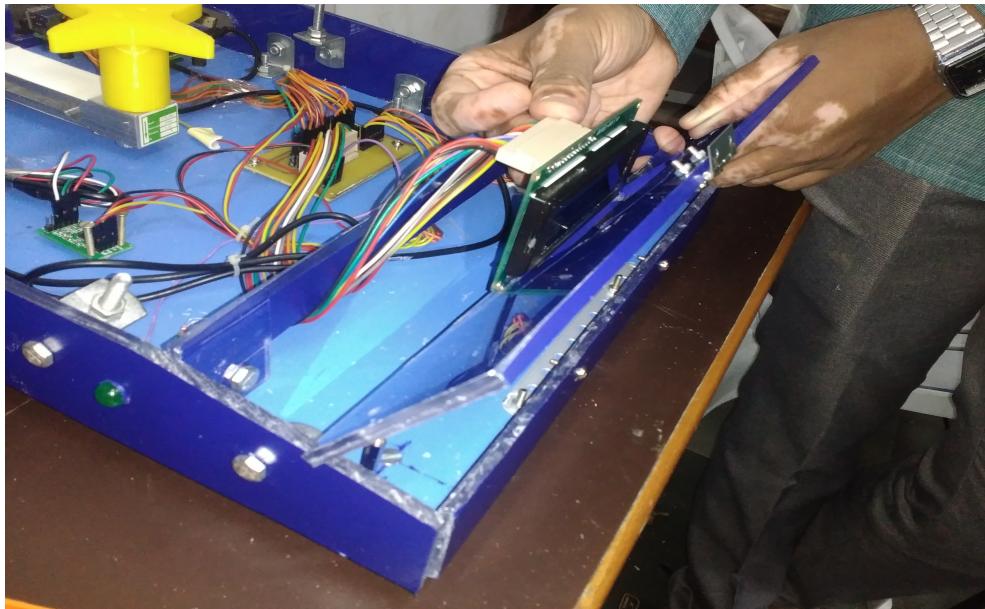


Assembling Steps

The dimension of the machine is 40x30x11.5cm. More detailed version of model can be found on github.



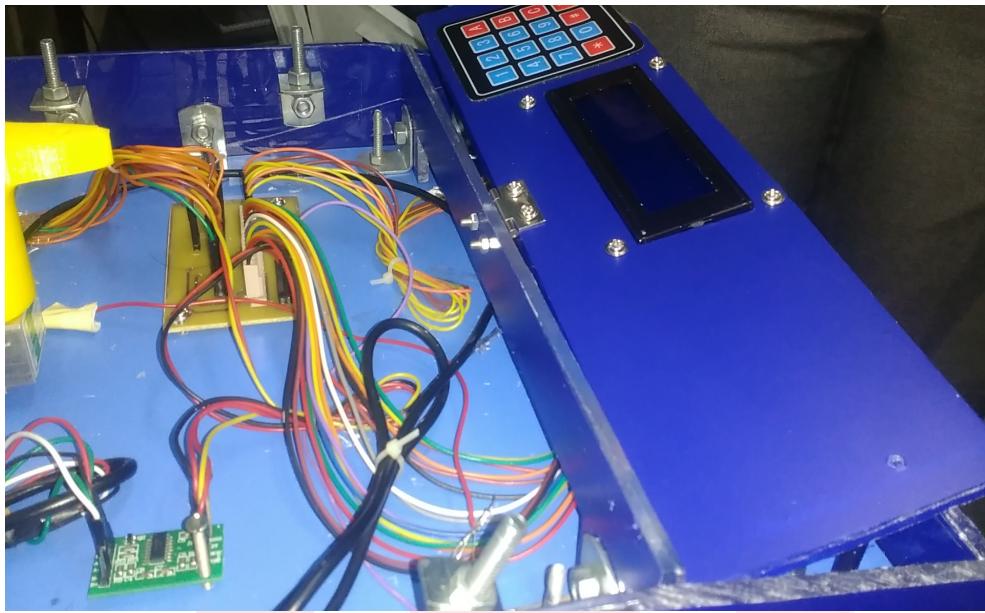
Step 1: Attach side plates, front plate, middle plate and back plate by using L clamps as shown in above diagram.



Step 2: Place LCD on front panel. Use 20x4 LCD.



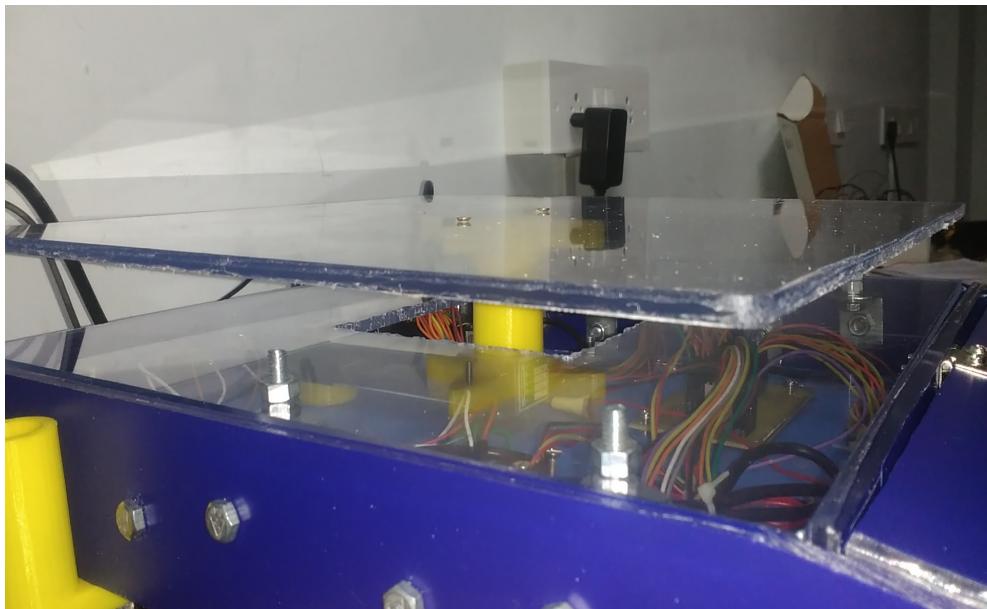
Step 3: Use four 3mm screws with bolts to fix the LCD on panel. After attaching LCD, Attach keypad to the front panel



Step 4: Attach front panel to the middle plate with the help of hinge. Use 3mm screws with bolts to attach front panel to middle plate.



Step 5: After attaching front panel, place the second top most plate over 4 screws attached with side plates. After putting the plate, user four nuts to fix the plate.



Step 6: Attach weighing platform on top of star shaped design and use 3mm screws with nuts to fix it.



Step 7: Finally attach camera stand at side of the machine.

1.5 Final Product



1.6 Future Work

In future this project can be made more effective by using image processing to identify which crop is put on the machine. We can also include bar-code or RFID module which will contain all the information about crop.

We can replace membrane keypad and LCD by touch screen.

This model can be transformed into more compact version.

1.7 Bug Report And Challenges

- Bug

- Currently e-commerce website is unable to sent email to users using SMTP server.
- Two way handshaking between server and machine is not implemented yet. Although it is a rare situation, data might get lost some times while transferring it to server because tow way hand shaking is not implemented yet

- Challenges

- Building enclosure of weighing machine.

-
- Calibration of load cell.
 - De-bouncing of keypad.



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