

THE PUSHCART- a weighing trolley

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Received :

Reviewed :

Revised :

Accepted : -8-2017

DOI:

ABSTRACT: Currently in this fast moving world everyone wants their work to be done in a smart way within a short span of time. Shopping is one of the major part of every human life. Every purchaser wants their shopping to be done in a smart and prompt way. Though purchasing of goods has been updated to a better way like barcodes, shopping of unpackaged items are hectic till now. So, we are proposing an idea for automating a trolley for unpackaged items like vegetables and fruits. Using this smart trolley purchaser can weigh the items. The obtained weight is used to calculate the price of the goods. This system does not need any shop assistants at the time of shopping. Based on customer wish, purchaser can add or remove items of their own. So this will reduce the waiting time of the customer at weighing section and billing section. At the time of shopping, price of each product and the grand total will be known to the customer before billing.

Keywords: Smart Shopping, Automated Trolley, Arduino Uno, Load cell, Unpackaged items.

1 Introduction

Shopping of fresh fruits and vegetables is a daily routine for home-makers. Though smart shopping had implemented in many cities, daily shopping of fresh items is quite difficult in departmental stores, shopping malls etc...We are designing a system to provide a solution to such difficulties by automating a trolley with weighing calibration. So every individual trolley will have the weight sensors to measure the products. Those measurements is transferred to a mobile device and their respective price can be calculated. So the customers need not to worry about the queue for weighing the products. The customers just weigh the product, select them from the list, then they can see the bill. Finally they have to settle the bill and complete their shopping by packing them. This system widely reduces the entire shopping time of the customers.

2 Literature Survey

[1]“Smart Trolley” Dennis Boamah, Amadu Ben Jalloh, Sarmad Ali, Ibanda Tex Tembi, Mahreen Riaz, Mingzhi Sun, Hugo Fernando - shopping is made smart by scanning the products. Using an user interface screen billing will be known to the customer. Automatic payment and self checkout system is implemented.

[2] “Smart Cart with Automatic Billing, Product Information, Product Recommendation Using RFID & Zigbee with Anti-Theft” Ankush Yewatakar, Faiz Inamdar , Raj Singh, Ayushya, Amol Bandal – designed to provide a centralized and automated billing system. RFID are used at the cart and as well as in the exit door to ensure security. Amount is transmitted to the central system through Zigbee.

[3]“Smart Trolley using Smart Phone and Arduino” Harpreet Singh Bedi, Nikhil Goyal, Sunil

Kumar and Avinash Gupta- developed based on RFID tags and Arduino. Membership card will be given to the customers that acts as the RFID reader to detect the products

[4]“**Smart Billing Trolley Using RFID & LIFI**” Gaikwad Prerna, Kalekar Shital, Shete Renuka, Thorat Komal, Nita R.Mhaske - RFID tags are used in trolley to detect the products. LIFI transmitter is attached to the trolley and LIFI receiver is fixed to the main server. Visible Light communication is used to transfer data between LIFI devices.

[5]“**A Review on Smart Trolley and Billing System**” Prof.Mukesh P.Mahajan, Gaikwad Jyoti Prakash, Gaikwad Ujjwala Prakash – RFID is used for product scanning and Raspberry Pi is used to interface with the main memory. Bill amount is displayed in the web application.

[6]“**Smart Cart Using Arduino and RFID**” Sarika S.Pandey, Soumya R.Gupta., Meenaz M.Shaikh, Komal M,Rawat, Prof. Pravin Jangid, Prof. Ragini Mishra - instead of barcodes, RFID tags are used for scanning and money management is ensured as total bill is known to the customer before billing.

3 Existing System

The available ideas behind existing smart trolleys are generally based on bar codes, RFID tags. Barcodes are generally pasted on the items and be used by scanning them using barcode scanners. RFID tags acts as both sender and receiver. The RFID tags are attached to the products and RFID reader is placed at the trolley. Whenever the tag is placed near the reader it detects and recognize those products. The major disadvantage of using RFID tags is that it cannot be used for unpackaged items in an efficient way. Since RFID tags are water sensitive they cannot be placed on fresh vegetables and fruits. Cost of RFID tags goes in a high rate if we attach them on each and every individual fresh item. We are proposing a new model to overcome these disadvantages.

4 Proposed System

In the proposed system we are developing a concept of automation in weighing and billing of goods inside the individual trolley. As this system mainly concentrates on unpackaged items, weighing is an essential part here. The purchaser after choosing the product, have to weigh them inside the trolley. The weight inside the trolley is sent to the mobile display attached to the trolley through Bluetooth module. The received data will be used by the mobile application in

order to calculate their corresponding price. So there is no need for the purchaser to seek any shop assistant to weigh the product and to calculate amount. Likewise all the commodities were purchased and their bill amount will be known to the customer while doing their shopping itself. This will reduce the purchaser waiting time at the billing counter. In addition to this, customer can shop their commodities with respect to their budget. If shopping goes beyond their budget, they can stop their shopping and can manage the commodities according to their plan.

5 Requirements

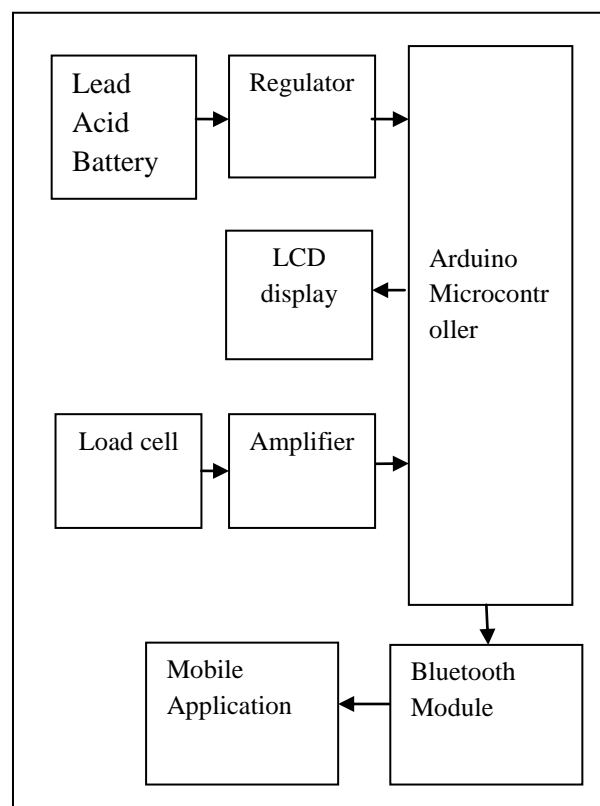
5.1 Hardware Requirements

- Arduino Uno
- Load Cell
- LCD Display
- Lm324 Amplifier
- Lead Acid Battery
- 7805 Voltage Regulator
- HC-05 Bluetooth Module
- Mobile Phone

5.2 Software Requirements

- Front End- Android Studio
- Back End- sqlite

6 System Design



7 System Description

7.1 Hardware Description

7.1.1 Arduino Uno

Arduino Uno is a microcontroller board used to communicate between two devices. In this system Arduino is connected with the Lead Acid Battery along with the regulator for its efficient usage. The purpose of using arduino in this system is to create a communication between the load cell and the mobile.

7.1.2 Load Cell

Load cell is a weight sensor used to measure the weight of the products being placed on them. In this trolley we are using the load cell to calculate weight of the fresh vegetables and fruits.

The load cell is connected to the Arduino through an amplifier. This amplifier is used to convert the 12V data from the load cell into 5V data that can be readable by the Arduino.

7.1.3 LCD Display

This LCD display is connected to the Arduino which is used to display the data from the Arduino. The Purchaser can see the weight in the LCD display attached to the Arduino.

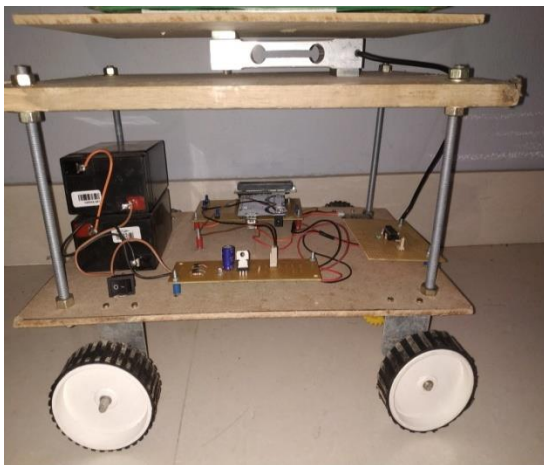


Fig1. HARDWARE SETUP

7.1 Software Description

A Mobile application developed in Android studio act as a user Interface. After placing the product in the load cell, the purchaser should select the product from the predefined list. The cost per quantity of the product is updated once daily. Now based on the recognized weight from the load cell, corresponding price for that product is calculated and displayed. Similarly, purchaser can weigh the product and give

input from the list of products displayed. Several products are purchased and total amount will be displayed to the purchaser before billing.

8 Conclusion

In this smart cart system, we are developing an user friendly environment for purchasing fresh commodities. So the customer can satisfy their daily needs very quickly. As products had weighed by the purchaser, billing section can be used only for amount transaction purpose. The consumers can not have any budget tension in shopping by using this system.

9 Future Scope

After weighing, the purchaser have to select the input in the mobile application. This can be updated to next level as scanning. QR codes or bar codes can be sticked to the products and mobile can be used as a scanner. So, the customer needs not to search for any products in the predefined list.

The cart can be enhanced by adding a credit card reader and a bill printer so that there will not be any more billing section. This will be the best solution for complete automation.

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