"SMART TROLLEY IN MEGA MALL"

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ABSTRACT

Arduino is an open source Platform used to build Electronic Project. Now a days, in mall for purchasing variety of items it requires trolley. The customer have to take the item & at the same time customer has to do calculation of those items & need to compare it with his budget in pocket. After this procedure, customer has to wait in queue for billing. To avoid this problem, we introducing the concept that is "Smart Trolley In Mega Mall". This trolley is totally automatic. In this the customer have to hold the item in front of the Barcode scanner & put in the trolley. The load cell sense the weight of the product. Then the corresponding information of the item will display on the LCD. At the billing counter, computer can be easily interfaced for verification & bill printout. This process reduce the headache of the consumer & also reduce the efforts of mall staff.
Keywords: ARDUINO ATMEGA328, BARCODE SCANNER, LOAD CELL, LCD, ZIGBEE.

1. INTRODUCTION

Shopping is one of the famous activity, that increases in this modern era. Many peoples choose to buy their necessary in mega mall. Mega mall has the unique design that can change buyers moods. When people who already work in one day visit the shopping mall, the will feel tired and not interested at the first time, but the unique designs make them comfortable and enjoy their activity to find products that they want to activity.

A mega mall or supermarket is a form where wide variety of product item is available. The supermarkets are beneficial to the customer, as the supermarkets provides all the products at the same place, it saves time. These products can be food products, apparels, gardening tools, electrical appliances or any household product.
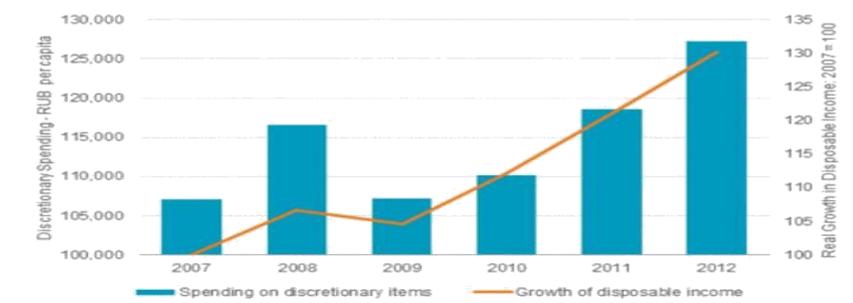
There is continuous growth of number of malls and number of consumers of mega malls in Indian Metropolitan and mid-sized cities. Which has made the automation is such malls a necessity.
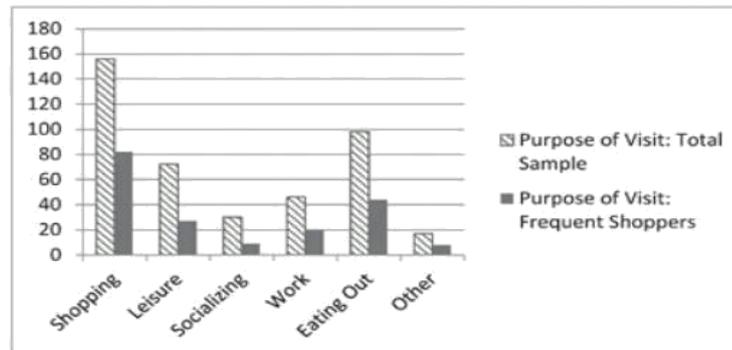

Figure 1. Primary purpose of trip, total sample and frequent shoppers.

Smart trolley which is of great used for shopping at the mega mall. The customers have to put the products in trolley and need to compare the cost of the product with their budget every time. After the shopping the ustomer have to stand in large queue for the billing purpose at billing counter. This process consumes more time and it becomes headache to the customer.

To avoid such headache, we have represented a paper **Smart Trolley Using A Barcode Scanner and the Arduino**. Arduino is used to display the price of product and weight of product in the LCD display. The system consists of an Barcode Scanner which communicates with the counter wirelessly using Zigbee.The customers have to scan the product themselves and the LCD screen which is placed on the trolley will keep updating the price and the weight of the products.

2.SYSTEM DESCRIPTION

In this system, the load cell is placed in the trolley and the barcode scanner is placed on the trolley, the customers have to scan the products and put in the trolley, weight sensor sense the weight of the product. The weight of the product will display on the LCD display. With the help of the barcode scanner , barcode is generated which is send to Arduino. Arduino interfaces with memory unit where all the information about the product and its price, weight is stored. The barcode ID is compared with the information in the memory unit and the result will display on the LCD. The initial weight is set to the zero. When the product is put in the trolley then the arduino compares the current weight and the previous weight. If the weight increases then the product is added and if the weight decreases then the product is removed. Once the shopping is done costumer have to press the button for the billing, then the data which is displayed on the LCD which is attached to the trolley would send to the computer at billing counter through the Zigbee module cc2500. This system saves the time of the customer and reduces the efforts of mall staff.

3. METHODOLO

GY 3.1 Block

Diagram
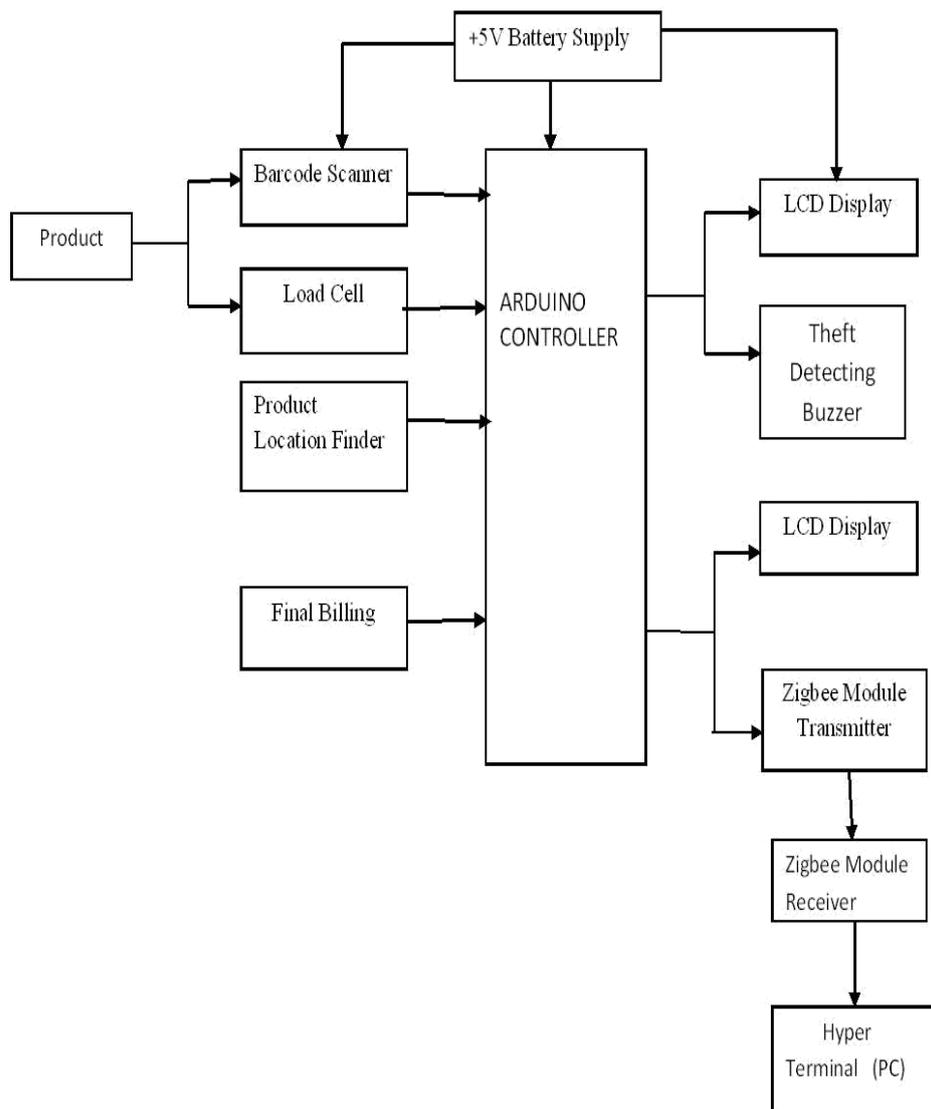
3.2 Block Description

Barcode Scanner

The customer have to take the product in front of the barcode scanner and the scanner will scan the barcode of the product. A barcode is used to encode information in a visual pattern readable by a machine. Barcodes are used for variety of reasons including tracking products, prices, and stock levels for centralized recording in a computer software system. A barcode scanners scans the black and white elements of a barcode by illuminating the code with red light which is then converted into matching text. More specifically the sensor in the barcode scanner detects the reflected light from the illumination system (the red light) and generates an analog signal that is sent to the decoder. The decoder interprets that signal, validates the barcode using the check digit, and converts it into text. This converted text is delivered by the scanner to a arduino uno holding a database of the maker, cost, weight and quantity of the product sold.

Load Cell

A load cell is a transducer that is used to create an electrical signal whose magnitude directly proportional to the force being measured. The various load cell types includes hydraulic, pneumatic and stain gauge. The electrical signal output is typically in the order of a few millivolts and requires amplification by an instrumentation amplifier before it can be used. The output of the transducer can be scaled to calculate the force applied to the transducer.

Arduino Uno

Arduino is open source platform used for building electronics project. Arduino consists of both a physical programmable circuit board and piece of software, or IDE (Integrated Development Environment) that runs on your computer , used to write and upload computer code to the physical board .

Zigbee Module

CC2500 RF Modem is a transceiver module which provides easy to use RF communication at 2.4 GHz. It can be used to transmit and receive data at multiple baud rates from any standard CMOS / TTL source. This module is a direct line in replacement for your serial communication it requires no extra hardware and no extra coding to turn your wired communication into wireless one. It works in Half Duplex mode i.e. it provides communication in both directions , but only one direction at same time (not simultaneously).This switching from receiver to transmitter mode is done automatically .

LCD Display

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits . These modules are preferred over seven segments and other multi segment LEDs. The reasons being LCDs are economical ; easily programmable ; have no limitations of displaying special and even custom characters (unlike in seven segments), animations and so on .a 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely , Command and Data.

The command register stores the command instructions given to the LCD. A command is an instructions given to LCD to do a predefined task like initializing it, clearing its screen , setting the cursor position , controlling display etc. the data register stores the data to be displayed on the LCD . The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a LCD.

Buzzer

A buzzer takes some sort of input and emits a sound in response to it. They may use various means to produce the sound; everything from metal clappers to electromechanical devices.A buzzer needs to have some way of taking in energy and converting it to acoustic energy. Many buzzers are part of a larger circuit and take their power directly from the devices power source. In other cases, however, the buzzer may be battery powered so that it will go off in the event of mains outage.

4. RESULT AND CONCLUSION

In Smart Trolley, there is no need to wait in billing queue and no need of thinking about budget. It gives number of products in trolley, and the total cost of the product at the shopping time. It also gives the total weight of the product. All this things are display on the LCD which is attached to the trolley. All this information is transferred to billing counter through Zigbee. This process reduces the headache of the costumer and it is also reduces the efforts of the mall staff. So we would successfully implement the concept of smart trolley.In future, using the Remote control there is no need to pull heavy trolley. And also using GPS tracker the customer come to know the exact location of the product.

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