IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

ISSN PRINT 2319 1775 Online 2320 7876

 Journal Volume 11, Iss 10, 2022

SMART SHOPPING TROLLEY IN SHOPPING MALLS USING IOT

[1]Aade Kailas Ukala,[2]A.Vinitha,[3]M.Krishna,[4]A.Shirisha

[1234]Assistant Professor

Department Of ECE

Kshatriya College of Engineering

ABSTRACT:

Nowadays, buying and searching for products at shopping malls are turning into a daily activity in cities. We can see many number of people shopping at malls on holidays and weekends. The rush happens when there are special offers and discounts. People purchase completely various things and place them in trolley. After total purchase, one must visit the billing counter for billing and making payments. In the billing counter, the cashier prepares the bill victimization bar code reader that might be a time overwhelming method and leads to long queues at billing counters. This paper targeted to minimize the Queue at a billing counter in a shopping mall. The smart shopping cart does the same by displaying the total price of the product kept inside the cart. In this way, the customer can directly pay the amount either in-app or in the billing counter and leave with the commodities he/she has bought. The hardware relies on Arduino Uno, RFID Reader Module, RFID Card, and Buzzer. It eliminates the normal scanning of products at the counter and in turn speeds up the entire process of shopping is easy and also with this system, the customer shall know the total amount to be paid. Hence the customer can plan his shopping only by buying the essential commodities according to his savings. Since the entire process of billing is based on RFID, so it reduces the possibility of human error substantially. The system also has a feature to delete the scanned products by customers to further optimize the shopping experience.

I.INTRODUCTION

Nowadays a number of shopping mall has increased around the world. Sometimes customers have problem regarding the incomplete information about the product on sale and waste of time at billing counters[1]. In existing system, shopping malls are using barcode standards [2]. This technique has replaced the previous manual system however has limitations. Barcode scanner requires a manual tracking, whereas RFID can be automatically tracked[3]. Barcodes additionally need a considerable quantity of manpower and human effort. Barcodes will get broken simply. Not solely this, The Barcode system needs the client to the square in long queues so as to induce their product scanned and their bills generated. This method will persuade be wearisome and it additionally consumes heaps of your time of the shoppers, thereby adding to their frustration. With such a big amount of disadvantages there too, the Barcode system remains in use. It is obvious that there is a desire to bring on a better and a lot of economical systems. The advent of newer techniques like RFID technology and wireless networks have makes the process of shopping at a faster pace, making it more efficient as well as making it more transparent[4].

Smart shopping cart using Arduino and RFID may be a new advancement in the field of Supply Chain Optimization. This method shall not only to skip the long queues in supermarkets and malls but also save plenty of your time for the purchasers. The system also helps the customer in saving money. The system uses RFID tags instead of Barcode tags which are much more efficient and powerful when it involves scanning of products. The device developed using Arduino and RFID shall be

ISSN PRINT 2319 1775 Online 2320 7876

 Journal Volume 11, Iss 10, 2022

installed on the handbasket or trolley. The customer shall scan their products by themselves and the calculation of the total amount happens on the cart and displays in the app itself. This shall also give a plan to the shoppers on what proportion their particular shopping session shall cost them. Hence, time management and money management shall be taken care of. The paper is ordered into five segments. the primary segment gives a fast introduction to the system. The second segment is about shopping systems and therefore the study of related existing systems. The third segment details the implementation of the system. The fourth segment displays the results obtained using the Arduino and RFID-containing device. Finally, the conclusion provides the summary and future scope of the system.

II.LITERATURE SURVEY

Dr. Suryaprasad J [5] in "A Novel Low-Cost Intelligent Shopping Cart" proposed to develop a low-cost intelligent searching aid that assists the client to go looking and select product and inform the client on any special deals out there on the product as they move around within the shopping complex.

Amine Karmouche [6] in "Aisle-level Scanning for Pervasive RFID-based Shopping Applications" proposed to develop a system that's ready to scan dynamic and static products in the shopping space using RFID Reader antennas. Instead of conducting the RFID observations at the level of individual carts, aisle-level scanning is performed.

Satish Kamble [7] in "Developing a Multitasking Shopping Trolley Based on RFID Technology" proposed to develop a product to help someone in everyday searching in terms of reduced time spent while purchasing. The main aim of proposed system is to produce a technology oriented, low- cost, easily scalable, and rugged system for assisting shopping in person

Mr. P. Chandrasekar [8] in "Smart Shopping Cart with Automatic billing System through RFID and ZigBee" proposed to develop a cart with a Product Identification Device (PID) which will contain a microcontroller, a LCD, an RFID reader, EEPROM, and ZigBee module. Purchasing product information will be read through a RFID scanner on cart, meanwhile product information will be stored into EEPROM attached to it and this EEPROM information will be send to Central billing System through ZigBee module. The central billing system gets the cart data and EEPROM information, it access the product database and calculates the total amount of purchasing for that particular cart.

COMPARISON OF EXISTING AND PROPOSED SYSTEM

We are using the Arduino Uno microcontroller, which helps to control the sensors of the electronic circuit controlled by the Android mobile application. It integrates various technologies such as RFID sensor, Arduino Uno, Bluetooth, Wi-Fi, supermarket management application and Android mobile application. These proposed model technologies have never been incorporated into the relevant system. Most supermarkets use barcode technology instead of RFID technology, which is a time-consuming process that requires scanning every product in sight. RFID technology is used in related industries, but it is not a customer-friendly environment. The ZigBee module is also used to track shopping carts. Multiple shopping carts exchange shopping information, which increases security risks and system costs. Wireless communication, providing a variety of software modules, allowing customers to use more reliable and flexible supermarket.

ISSN PRINT 2319 1775 Online 2320 7876

III.DESIGN OF HARDWARE

This chapter briefly explains about the Hardware. It discuss the circuit diagram of each module in detail.

ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode. Arduino board has the following new features:

- 1.0 pin out: added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. The second one is a not connected pin, that is reserved for future purposes.

- Stronger RESET circuit.

- Atmega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

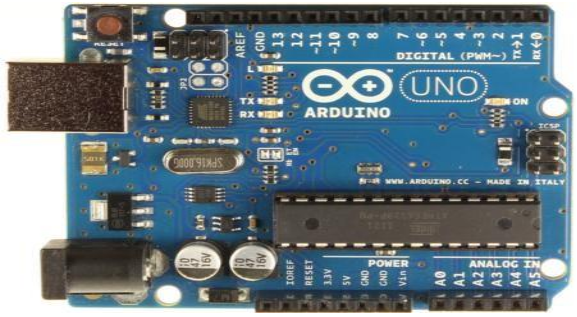


Fig: ARDUINO UNO

POWER SUPPLY:

The power supplies are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which performs a particular function. A d.c power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as “Regulated D.C Power Supply”.

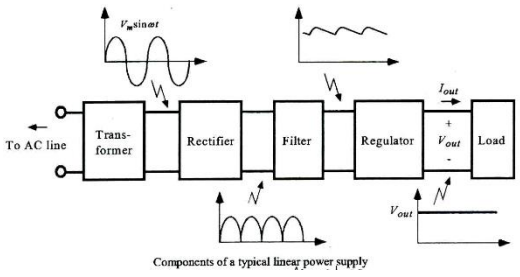


Fig: Block Diagram of Power Supply

ISSN PRINT 2319 1775 Online 2320 7876

 Journal Volume 11, Iss 10, 2022

LCD DISPLAY

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.

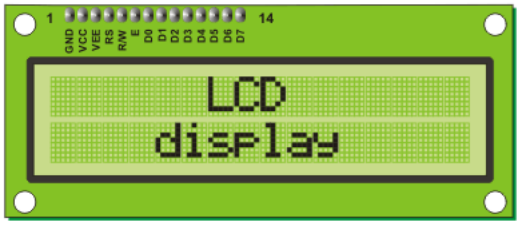
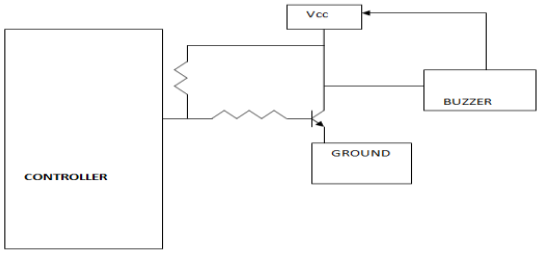


Fig: LCD

BUZZER

Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10milli amps to be operated, the microcontroller's pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.



WIFI MODULE:

The **ESP8266** is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems.[1]

The chip first came to the attention of western makers in August 2014 with the **ESP-01** module, made by a third-party manufacturer, Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at the time there was almost no English-language documentation on the chip and the commands it accepted.[2] The very low price and the fact that there were very few external components on the module which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.[3]

The **ESP8285** is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.[4]

The successor to these microcontroller chips is the ESP32.

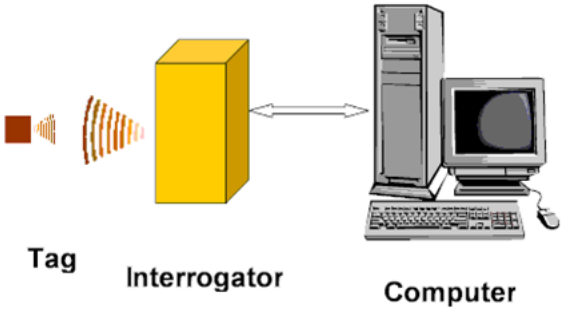
RFID (RADIO FREQUENCY IDENTIFIER)

Radio-frequency identification (RFID) is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be applied to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Some tags can be read from several meters away and beyond the line of sight of the

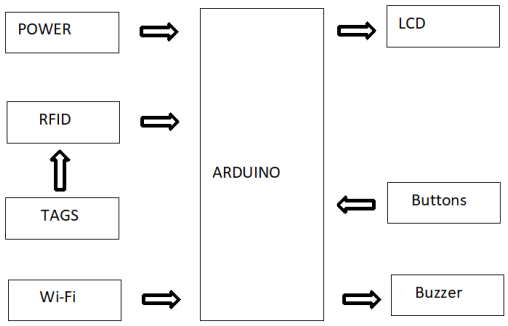
ISSN PRINT 2319 1775 Online 2320 7876

 Journal Volume 11, Iss 10, 2022

reader. Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. Chip less RFID allows for discrete identification of tags without an integrated circuit, thereby allowing tags to be printed directly onto assets at a lower cost than traditional tags.



IV. BLOCK DIAGRAM:



Working: The main aim of this proposed project is to develop a system which is used to solve the problem in the conventional trolley method and also provide child missing alert in that trolley itself .In this system RFID reader will be placed in each and every trolley in the mall and all the products will be equipped with RFID tags. When a person puts any products in the trolley, it"s code will be detected and price of those products will be stored in the memory ,its name and cost will be displayed on LCD and it will send to billing counter by wireless module. This trolley can be used to track the child „s location from the trolley when there is a big crowd in the mall. Which is possible by using RF transmitter and RF receiver. RF receiver is placed in corresponding trolley of the customers(parent"s)and RF transmitter is given to their child .so if the child moves far from their trolley then immediately that trolley generates alert message for customer(parent"s).

V.CONCLUSION

The smart shopping cart application helps the retailers to manage the customers in an efficient way since the customers need not have to wait in long queues. Since the data of the purchased products are displayed in the mobile display the customers can get to know about the bill details in advance with which the customer can plan for an affordable purchase. This system thus helps in achieving a faster billing system. Through this way of shopping system, more customers can be served at the same time thus benefiting the customers and retailers as well. The proposed system does not make use of an intricate routing system.

REFERENCES:

[1] G S Rajagopal, Mr. S Gout, "Small Intelligent System for Shopping and Billing", International journal of Advance Research Trends in Engineering and Technology, Volume 3, Special issue 19, April 2016.

[2]S Jai Ganesh, S Sahithi, S Akhita, "RFID Based Shopping Cart", International Journal of Innovative Research in Engineering & Management, Volume 2, issue 3, May 2015.

[3] Komal Ambekar, Vinayak Dhole, Supriya Sharma, Thushar Wadeksr, "Electronic Shopping Cart based on RFID", International Journal of Innovative Research in Electronics, Volume 3, issue in January 2015.

[4]Aniket Wani, Kurtika Thakar, Nikhil Vaze, "RFID Based Intelligent Trolley System", International journal of Engineering, ISSN: 23197442 Volume 4 issue 3 March 2015.

ISSN PRINT 2319 1775 Online 2320 7876

 Journal Volume 11, Iss 10, 2022

[5] Dr. Suryaprasad J, Praveen Kumar B O, Roopa D & Arjun A K "A Novel Low-Cost Intelligent Shopping Cart", 2014 IEEE.

[6] Amine Karmouche, Yassine Salih-Alj, "Aisle-level Scanning for Pervasive RFID-based Shopping Applications", 2013 IEEE.

[7] Satish Kamble, Sachin Meshram, Rahul Thokal & Roshan Gakre, "Developing a Multitasking Shopping Trolley based on RFID Technology", January 2014 International Journal of Soft Computing and Engineering (IJSCE).

[8] Mr. P. Chandrasekar, Ms. T. Sangeetha, "Smart Shopping Cart with Automatic Central Billing System through RFID and ZigBee", 2014 IEEE.