INTERNATIONAL JOURNAL OF ENGINEERING INNOVATIONS IN ADVANCED TECHNOLOGY
ISSN [O]: 2582-1431 VOLUME-4 ISSUE-1 JAN-MAR 2022 pp: 78-82

Smart Shopping Trolley

B Jyothi
Anurag Group Of Institutions, Department Of CSE, Hyderabad, India.
Email: bjyothicse@cvsr.ac.in

G Meena, G Pranathi, P Varsha
Anurag Group Of Institutions, Department Of CSE, Hyderabad, India.
Email: meenagajibanda29@gmail.com, pranathigundagani@gmail.com, pashamvarsha@gmail.com

***Abstract*— A shopping mall is a place where hundreds of customers visit every day to purchase many items. Now a days shopping malls are increasing rapidly due to availability of all the items ranging from grocery, clothes, vegetables, fruits, etc., in the common place. Trolley is required to collect the items in the shopping mall. Trolley has to be pulled forward or backward while collecting the items. After purchasing the product, the customer has to stand in a long queue for billing their products. To overcome this problem we are developing intelligent trolley for shopping mall. Each and every product in the shopping mall contains the RFID tag and the trolley is fitted with RFID reader. When the customer drops the product in the trolley the reader reads the tag and display the item and the amount in LCD which is fitted in the trolley. After the completion of shopping, the customer will press the finish button in the trolley and total bill is displayed in the LCD and the bill is transferred to the main computer.**

***Index Terms*—IOT, LCD Display Screen, Arduino UNO**

I.. INTRODUCTION

Due to the improvement in the human lifestyle the people running towards the money and they do not have the enough time to go to various shop to purchase their necessities. Shopping mall is the place where we get the daily necessities ranging from food products, clothing, electrical items etc., therefore the number of shopping malls are increased. After purchasing the stuff, the people will have to stand in a long queue to bill their items. It creates the problem among the customer while standing in the queue. In existing system, the shopkeeper will scan the barcode of every product which is very time consuming. To avoid this problem, we proposed the "Intelligent trolley for shopping mall". This can be done by simply adding the Rfid reader in the trolley and RFID reader in the product. The bill amount is displayed in the LCD. It is very time consuming, cost efficient and reliable method. This system will save the time for the customers and manpower required in the mall.

Manuscript received February 15,2022; Revised March 16, 2022; Accepted March 27, 2022.

It consists of voice board and baby unit. Voice board tells the product name using speaker and it is displayed in

LCD along with its cost and expiry details. The child unit intimates the consumer if the child that has been brought has moved away from the cart through LED. LED gets turned off if the sign is misplaced from RF transmitter which is with the child. Thus toddler unit helps track the child as the unit gives alert. If clients want to eliminate the product from the cart that they have taken, they can do it by the use of a key. Once purchasing is over, the total amount will be displayed in the LCD and billing can be accomplished by using QR code. At the exit point checking of consignment and packing of merchandise can be done. In order to make shopping less difficult for shoppers in malls/shops, there have been a number of strategies planned for clever purchasing trolleys. By eliminating waiting in lengthy billing lines, it saves customer time & it is efficient to use.

II.. LITERATURE SURVEY

A. SMART TROLLEY USING RFID:

Nowadays, buying and searching at huge malls is turning into a daily activity in subway cities. We can see large rush at malls on holidays and weekends. The rush is even a lot of once there are special offers and discount. People purchase totally different things and place them in trolley. After total purchase one needs to go to cashier for payments. The cashier prepares the bill victimization bar code reader that could be a time overwhelming method and leads to long queues at charge counters. This paper targeted to minimize the Queue at a billing counter in a shopping complex. Smart Trolley 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 at the billing counter and leave with the commodities he/she has bought. The hardware is based on Arduino Uno, RFID Reader Module, RFID Card and Buzzer. It eliminates the traditional scanning of products at the counter and in turn speeds up the entire process of shopping, also with this system the customer shall know the total amount to be paid and hence can accordingly plan his shopping only buying the essential commodities

resulting in enhanced savings. Since the entire process of billing is automated it reduces the possibility of human error substantially. Also, the system has a feature to delete the scanned products by customer to further optimize the shopping experience.

B. *Smart Shopping Trolley Using RFID:*

The various items are purchase in shopping mall or markets with help of shopping trolley. This product acquirement is some difficult process. In customer convenience they have to pull the trolley for each time to collecting items and simultaneously. After purchasing, customer want to pay the bill for their purchasing. In that time, they have to wait in a long queue to get their products scanned using RFID reader with help of barcode Scanner and get their billed. To modify that and customer has to purchase in smart way in shopping mall. Each and every product has to place a RFID barcode to scan the product with RFID reader. The smart trolley will consist of a RFID reader, LCD display and ZigBee transmitter. When customer if want to buy any product is insert in the trolley. It will scan and read the product and display the cost and the name of the product in LCD.

III.. HARDWARE COMPONENTS

A. *POWER SUPPLY*

In mains-supplied electronic systems the AC input voltage must be converted into a DC voltage with the right value and degree of stabilization. In these basic configurations the peak voltage across the load is equal to the peak value of the AC voltage supplied by the transformer's secondary winding. For most applications the output ripple produced by these circuits is too high. However, for some applications - driving small motors or lamps, for example - they are satisfactory. If a filter capacitor is added after the rectifier diodes the output voltage waveform is improved considerably. The section b-c is a straight line. During this time it is the filter capacitor that supplies the load current.

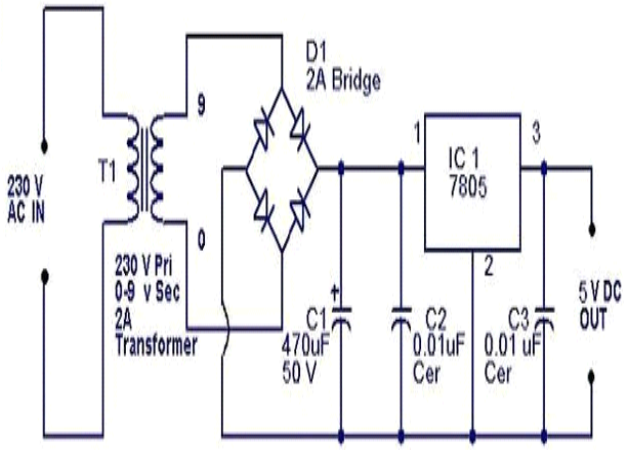

Figure 1 Power supply

B. *RFID MODULE:*

Radio Frequency Identification (RFID) uses electromagnetic fields to automatically identifies and track tags attached to objects. An RFID system consists of a tiny radio transponder, a radio receiver and transmitter. When triggered by an electromagnetic interrogation pulse from a nearby RFID reader device, the tag transmits digital data, usually an identifier inventory number, back to the reader. This number can be used to track inventory goods.

Figure 2 RFID Module

C. *ARDUINO UNO*

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. Arduinos (we use the standard Arduino Uno) are built around an ATmega microcontroller essentially a complete computer with CPU, RAM, Flash memory, and input/output pins, all on a single chip.

Unlike, say, a Raspberry Pi, it's designed to attach all kinds of sensors, LEDs, small motors and speakers, servos, etc. directly to these pins, which can read in or output digital or analog voltages between 0 and 5 volts.

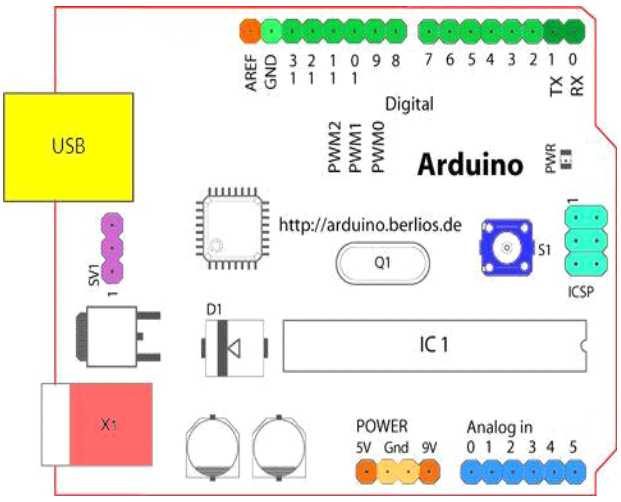

Figure 3 ARDUINO UNO

D. PINS

Digital Pins-In addition to the specific functions listed below, the digital pins on an Arduino board can be used for general purpose input and output via the pin Mode(),Digital Read(),and DigitalWrite HYPERLINK "http://arduino.cc/en/Reference/DigitalWrite"()command s. Each pin has an internal pull-up resistor which can be turned on and off using digitalWrite() (w/ a value of HIGH or LOW, respectively) when the pin is configured as an input. The maximum current per pin is 40mA.
*Serial: 0 (RX) and 1 (TX)***.** Used to receive (RX) and transmit (TX) TTL serial data. On the Arduino Diecimila, these pins are connected to the corresponding pins of the FTDI USB-to-TTL Serial chip.

*External Interrupts: 2 and 3***.**These pins can be configured to trigger an interrupt on a low value, arising or falling edge, or a change in value.
See the HYPERLINK "http://arduino.cc/en/Reference/AttachInterrupt"attach HYPERLINK "http://arduino.cc/en/Reference/AttachInterrupt"Interrupt(HYPERLINK "http://arduino.cc/en/Reference/AttachInterrupt")function for details.
PWM: 3, 5, 6, 9, 10, and 11 Provide 8-bit PWM output with the HYPERLINK "http://arduino.cc/en/Reference/AnalogWrite"analog HYPERLINK "http://arduino.cc/en/Reference/AnalogWrite") function. On boards with an ATmega8, PWM output is available only on pins 9, 10, and 11.
BT Reset: **7.**(Arduino BT-only) Connected to the reset line of the bluetooth module.
SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication, which, although provided by the underlying hardware, is not currently included in the Arduino language.
*LED: 13***.** On the Diecimila and Lily Pad, there is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

Analog Pins-In addition to the specific functions listed below, the analog input pins support 10-bit analog-to-digital conversion (ADC) using the HYPERLINK "http://arduino.cc/en/Reference/AnalogRead"analog HYPERLINK "http://arduino.cc/en/Reference/AnalogRead" HYPERLINK "http://arduino.cc/en/Reference/AnalogRead"Read(HYPERLINK "http://arduino.cc/en/Reference/AnalogRead")function. Most of the analog inputs can also be used as digital pins: analog input 0 as digital pin 14 through analog input 5 as digital pin 19. Analog inputs 6 and 7 (present on the Mini and BT) cannot be used as digital pins.

Power Pins:
VIN (sometimes labeled "9V"): The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source).
5V: The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.
3V3(Diecimila-only) :A 3.3 volt supply generated by the on-board FTDI chip.

*GND:*Ground pins.

*Other Pins***:**

*AREF***:**Reference voltage for the analog inputs. Used with analogreference().

Reset: (Diecimila-only) Bring this line LOW to reset the microcontroller. Typically used to add areset button to shields which block the one on the board.

E. LCD

This is an example for the Parallel Port. This doesn't use the Bi-directional feature found on newer ports, thus it should work with most, if noall Parallel Ports.These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

Figure 4 LCD Display

IV. METHODOLOGY

These ID's are fed in the database assigned to the corresponding products. Every product has an RFID tag which contains a unique IDE need to be a purchase done, then that product can be dropped in the trolley where the RFID reader reads the tag. When a customer wants to remove any product from the trolley, then that product needs to be scanned again. At the same time billing

information is updated. The total amount of purchases is also displayed on screen.These steps are repeated until the end of shopping button or send bill button is pressed. This generated bill is sent to billing side computer to get the computerized bill.

V. ARCHITECTURE

A. *Block diagram*

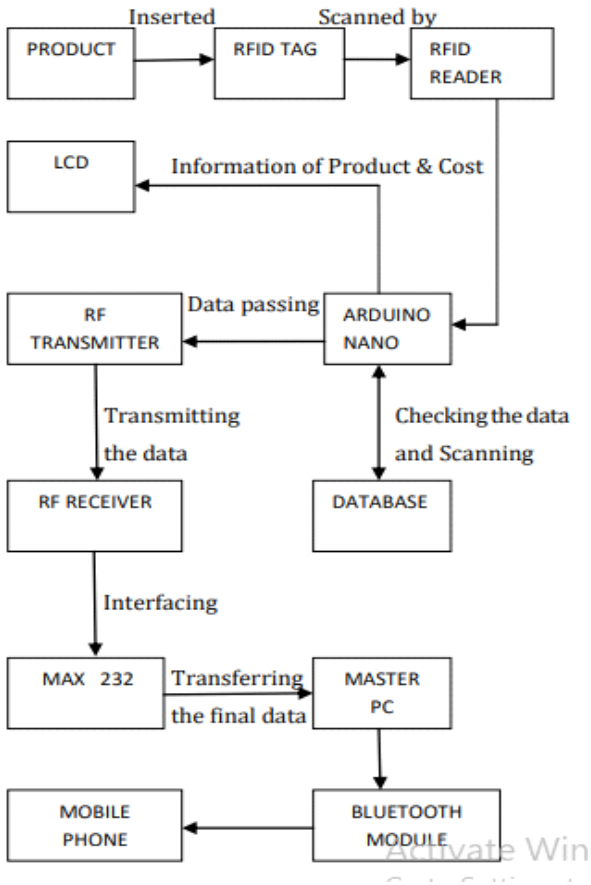

Figure 5 Architecture Block Diagram

B. *RESULT*

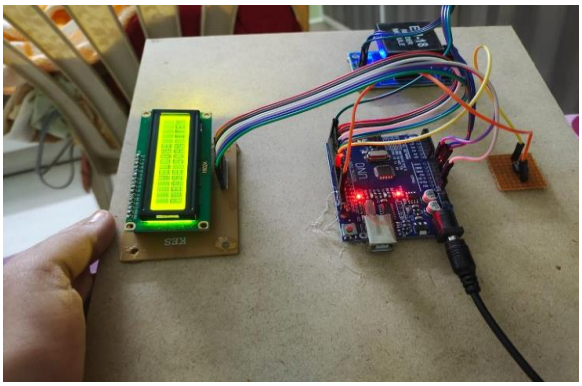

Figure 6 Result

CONCLUSION

The progress in technology and science is a non-stop process. This project is used in the shopping mall for purchasing the items. In this project the trolley is used for automatic billing. If the item is put into the trolley it will shows the amount in the LCD. The RFID card is used for accessing the product. By means of this project we intent to simplify the billing process and saves the time for the customer. Different parameters such as product name, product cost will be displayed in the LCD. Thus with the help of the conclusion we can say that: Automatic billing of the product will be a more viable option in the future. The system based on RFID technique is compact, efficient and shows promising performance.

FUTURE ENHANCMENT

The proposed system does not make use of intricate routing system architecture. Rather it uses simple algorithms in order to banish existing problems. Model can be further extended, to prevent the loosing of the intelligent/smart shopping trolley. It can be concluded that the initial cost of the model maybe high but in the subsequent years the model will be beneficial as compared to the system using barcode or manual system. Further, more advanced microcontroller, large display modules and service to pay the bill with in the trolley by using the swapping card can be used, thus providing the customer better services improve consumer experience and improving time complexity to a great extent.

.

REFERENCES

[1] Fabian B, Ermakova T, Muller C. Shardis, “Privacy-enhanced discovery service for RFID-based product information,” IEEE Transactions on Industrial Informatics. 2012Aug; 8(3).

[2] Suryaprasad J, Praveen Kumar B O, Roopa D Arjun A K, “A Novel LowCost Intelligent Shopping Cart,” Proceedings of the 2nd IEEE International Conference on Networked Embedded Systems for Enterprise Applications, NESEA 2011, Perth, Australia, December 8-9, 2011

[3] Swati Zope, Maruti Limkar, “RFID based Bill Generation and Payment through Mobile”, International Journal of Computer Science and Network (IJCSN), Volume 1, Issue 3, June 2012

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

[5] Martin Mayer, Nobert Gortz and JelenaKaitovic, "RFID Tag Acquisition via Compressed Sensing", 2014 IEEE.

[6] 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).

[7] P.Chandrasekar, T.Sangeetha, "Smart Shopping Cart with Automatic Central Billing System through RFID and ZigBee", 2014 IEEE
[8] Zeeshan Ali, Reena Sonkusare, "RFID Based Smart Shopping and Billing", International Journal of Advanced Research in Computer and Communication Engineering Vol.2, Issue 12, December 2013

AUTHORS PROFILE

B.Jyothi is one of the co-authors of this paper. She has received Master of Technology in computer science and Engineering from Jawaharlal Nehru Technological University, Hyderabad in 2010, and she is Pursuing Ph.D in computer science and Engineering with major specialization on Trajectory Data Mining from KLEF. She is currently working as Assistant Professor in the field of computer science and engineering, from Anurag Group of Institutions, Hyderabad, Telangana, India. Her research interests are in the fields of Data Mining and Big Data Analysis. She had published papers on 'Education through soft learning in India' and 'Efficient load reblancing problem in hadoop distrubuted file system'.

G.Meena is one of the co-authors of this paper. She was born in Telangana on September 25,2000. She is currently pursuing B.Tech. Degree in the field of computer science and engineering, from Anurag Group of Institutions, Hyderabad, Telangana, India. Her previous research interests are in the fields of Internet Of Things. Her current field of Interest is Machine Learning and Data Science. She is an active participant in the paper presentation events conducted at his college.

G.Pranathi is one of the co-authors of this paper. She was born in Telangana on July 7,2001. She is currently pursuing B.Tech. Degree in the field of computer science and engineering, from Anurag Group of Institutions, Hyderabad, Telangana, India. She is currently working at Capgemini as an Intern in Hyderabad. Previous research interests of her are in the fields of Internet Of Things. Her current field of Interest is Machine Learning and Data Science. She is an active participant in the paper presentation events conducted at her college.

P.Varsha is one of the co-authors of this paper. She was born in Telangana on July 4,2000. She is currently pursuing B.Tech. Degree in the field of computer science and engineering, from Anurag Group of Institutions, Hyderabad, Telangana, India.H er previous research interests are in the fields of Internet Of Things. Her current field of Interest is Machine Learning and Data Science. She is an active participant in the paper presentation events conducted at his college