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Shopping Cart

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Abstract: ***The number of small and large malls are increasing over the years. The malls are increasing because of the increase in population and demand of the general people. People purchase required items and go to the cashier for paying bill. Paying bill directly at the billing counter consumes a lot of time and it leads to large queue at the cashier. Shopping cart displays the total price of the product kept inside the cart and paves the way to directly pay the amount through the card given to customer. The hardware is based on Arduino Uno, RFID Reader Module, RFID Card. It eliminates the traditional scanning of products at the counter and in turn speeds up the entire process of shopping.***
Keywords: Shopping, Billing, Paying, RFID, Arduino, zigbee.

I. INTRODUCTION

These days as number of shopping malls and the number of customers are increasing and hence the infrastructure at the malls is getting updated. Customers face problems while shopping. Some of them are worrying whether the money brought is enough for paying all the items needed, and wasting time at the cashier. Shopping cart speeds up the entire process of shopping, also with this system the customer knows the total amount to be paid in advance and so he can plan his shopping. He can buy only the essential items and save money. Since the entire process of billing and paying is automated it reduces the possibility of human error substantially and increases shopping speed.

Using RFID technology in supermarkets can also provide detailed information on customer purchase behaviour. Currently most of the supermarkets use a barcode-based system whereby an item is assigned a serial number printed on the barcode label attached to an item and the item related information is stored in the database of the back-end system. To perform inventory control, someone has to scan the barcode label of each item and compare them with existing inventory list. This is a lengthy and error prone process; as a result it's done less frequently and hence often is not up-to-date. The capabilities of the barcode technology are limited in term of functionalities that businesses require (Bendavid et al.,2006). RFID technology offers a solution to the above mentioned problem.

II. LITERATURE SURVEY

"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. *DR. SURYAPRASAD from computer Science and Engineering.*

"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. *Amine Karmouche from computer Science and Engineering.*

In this paper the author found such a system it consists of GSM, RFID, Automatic Billing, OTP, ZIGBEE, PIC. In this scheme, the item can be read by the reader and the total of the item is showed on the LCD screen.

In this paper the author invented such a system it consists of RFID, ARM7, Display, Power supply, Switch, IR sensor pair, Barcode reader Visual Basics. The system works as the inventor use the barcode reader as well as RFID. And our shopping is done through the serial communication we transferred the total bill to the counter for printing the hardcopy of the product bill. There is also facility for the payment is credit card or any other. The drawback of the system is their uses both the reader RFID and Barcode Reader because of that the system becomes more multifaceted.

III. EXISTING SYSTEM

An innovative product with societal acceptance is the one that aids the comfort, convenience and efficiency in everyday life. Purchasing and shopping at big malls is becoming daily activity in metro cities. There will be rush at these malls on holidays and weekends. People purchase different items and put them in trolley. After completion of purchases, one needs to go to billing counter for payments. At billing counter the cashier

Smart Shopping System prepare the bill using bar code reader which is very time consuming process and results in long queue at billing counter.

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A. Disadvantages

1) Time consuming.

2) Wastage of human energy for waiting in long queues.

IV. PROPOSED SYSTEM

To develop automated billing and paying system for supermarkets using RFID tags in order to accomplish more quickly the billing process. To reduce the manpower and to speed up the billing and paying process at supermarkets we proposed the new system which includes automatic billing and paying of money without going to the cashier. It uses RFID tags for billing and it does not need any staff for billing and for paying of money for the purchased products in the market.

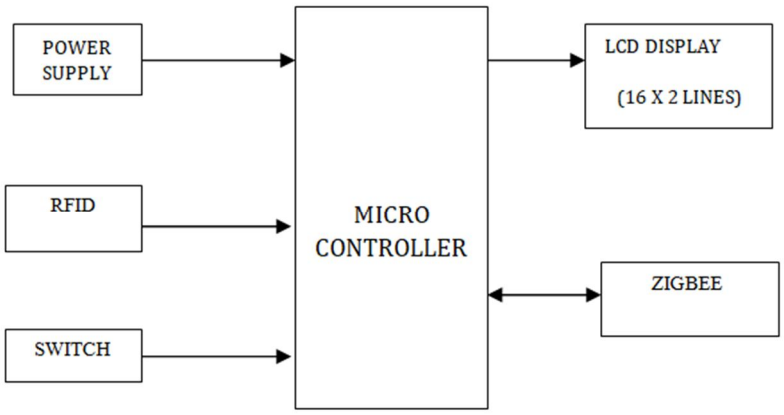
A. Advantages

1) Automated billing and paying.

2) It does not need any staff for billing and paying.

3) It Speeds up the paying process than that in older one.

V. METHODOLOGY OF PROPOSED SYSTEM



Power supply section consists of a Transformer to step down the 230V ac to 9V ac followed by diodes. Micro controller section forms the control unit of the whole project. LCD section is basically meant to show up the status of the project. Radio Frequency Identification (RFID) is a generic term for non-contacting technologies that use radio waves to automatically identify people or objects. ZIGBEE is primarily designed for the wide ranging controlling applications and to replace the existing non-standard technologies.

VI. REQUIREMENTS TO IMPLEMENT

A. Arduino Uno(ATMEGA328P)

Overview: 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.

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 crystal oscillator, 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 Atmega8U2 programmed as a USB-to-serial converter.

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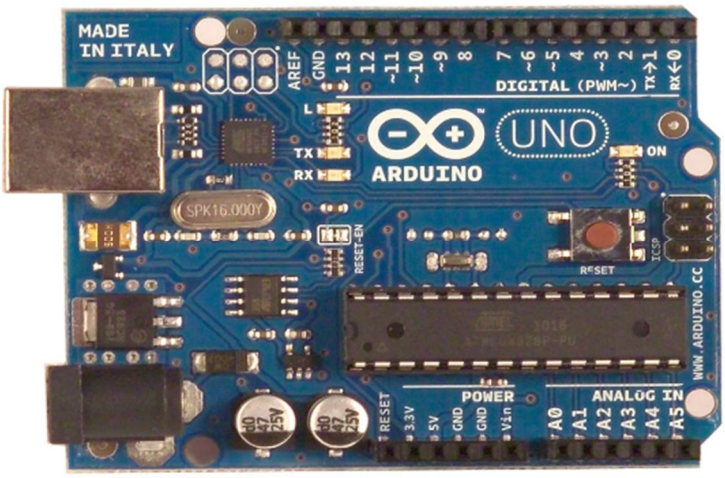
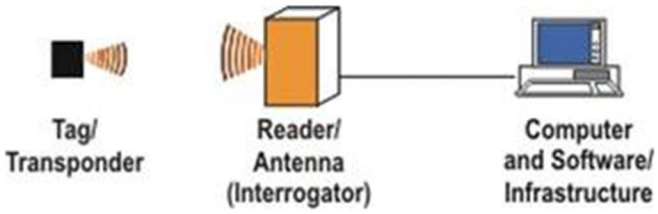
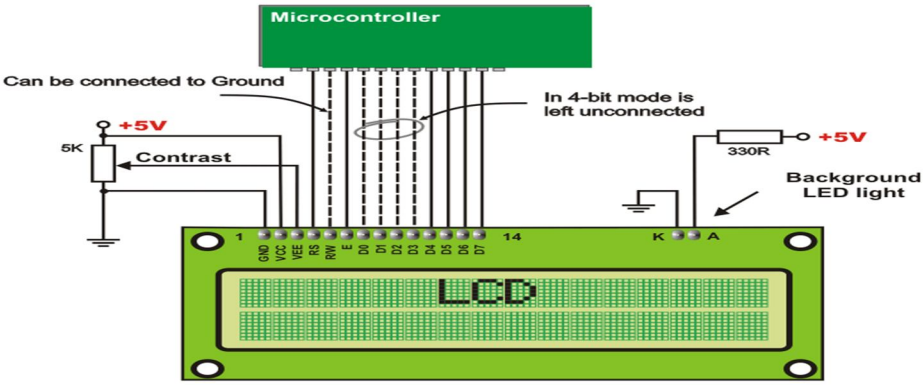


1) *RFID System:* In a regular RFID machine tags are connected to objects. Each tag has a certain quantity of inner memory (EEPROM) wherein it stores information approximately the object, along with its particular identity (serial) variety, or in a few cases more details inclusive of manufacture date and product composition. while these tags pass via a discipline generated by a reader, they transmit this facts returned to the reader, thereby identifying the object.



2) *LCD:* Liquid crystal displays (LCDs) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal. The LCDs used exclusively in watches, calculators and measuring instruments are the simple seven-segment displays, having a limited amount of numeric data. The recent advances in technology have resulted in better legibility, more information displaying capability and a wider temperature range. These have resulted in the LCDs being extensively used in telecommunications and entertainment electronics. The LCDs have even started replacing the cathode ray tubes (CRTs) used for the display of text and graphics, and also in small TV applications.



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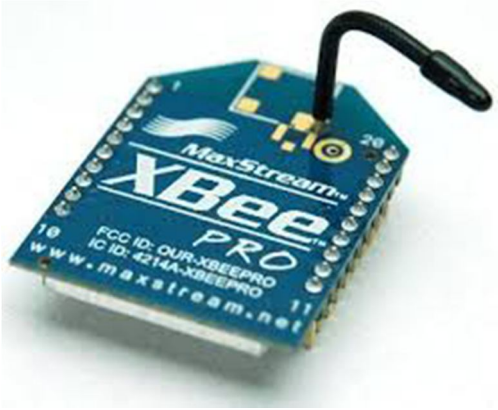
3) Zigbee: ZIGBEE is a new wireless technology guided by the IEEE 802.15.4 Personal Area Networks standard. It is primarily designed for the wide ranging automation applications and to replace the existing non-standard technologies. It currently operates in the 868MHz band at a data rate of 20Kbps in Europe, 914MHz band at 40Kbps in the USA, and the 2.4GHz ISM bands Worldwide at a maximum data-rate of 250Kbps.

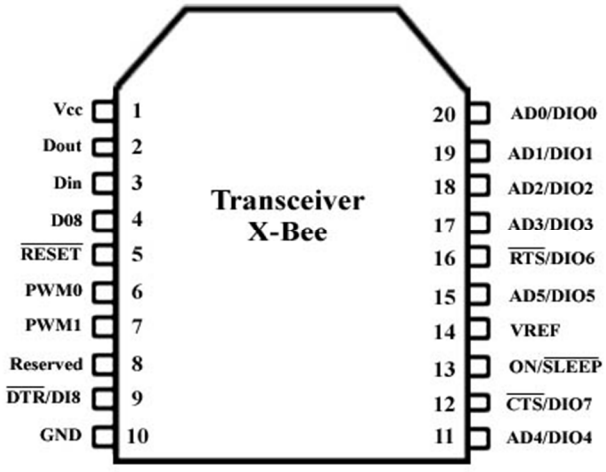


Zigbee Trasceiver

Zigbee modules feature a UART interface, which allows any microcontroller or microprocessor to immediately use the services of the Zigbee protocol. All a Zigbee hardware designer has to do in this ase is ensure that the host's serial port logic levels are compatible with the XBee's 2.8- to 3.4-V logic levels. The logic level conversion can be performed using either a standard RS-232 IC or logic level translators such as the 74LVTH125 when the host is directly connected to the XBee UART. The below table gives the pin description of transceiver.

B. Zigbee Transceiver

1) Pin Diagram



Pin diagram of of X-Bee Transceiver

VII. WORKING MODEL & PROCEDURE

Start the process. The system gets power supply from the transformer. Whenever the RFID module scans the product it transmits the data to the Arduino. From there the Arduino sends the instructions to the LCD to display the product cost and total cost till. The Arduino also sends the data to the Zigbee transmitter from there the transmitter sends the data to counter using Zigbee receiver. Therefore the bill payment details will be displayed at the counter for verification.

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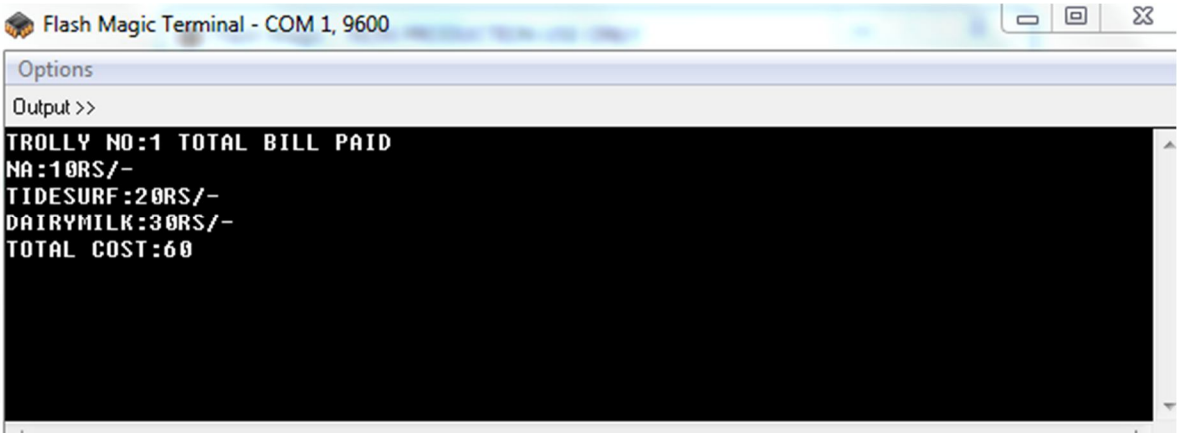
VIII. RESULTS/WORKING PROTOTYPE

LCD welcome Screen



Display at the counter

IX. CONCLUSION & FUTURE DIRECTIONS

In this paper, a method for to address the problems such as wastage of time for waiting in long queues and planning of Shopping in advance. This system has been designed to display the cost of products and total cost in the trolley. It also provides the way for directly paying the bill through the issued card. And it also sends the bill payment data to the counter.

There are many future scopes regarding this project such as follows: -In the existing system there is a lot of time wastage but here our system reduces the wastage of time and it makes shopping comfortable to the customers. But in this project if the user wants to pay the bill he has to purchase a card. He will be given this card in the shop itself. In future enhancement to make it more comfortable we want to implement in such a way that card can be issued through online. And in our project if the card amount is completed he wants to purchase one more card and use that. In future enhancement we would like to implement in such a way that user can register through online and he can also recharge his card directly through his mobile.

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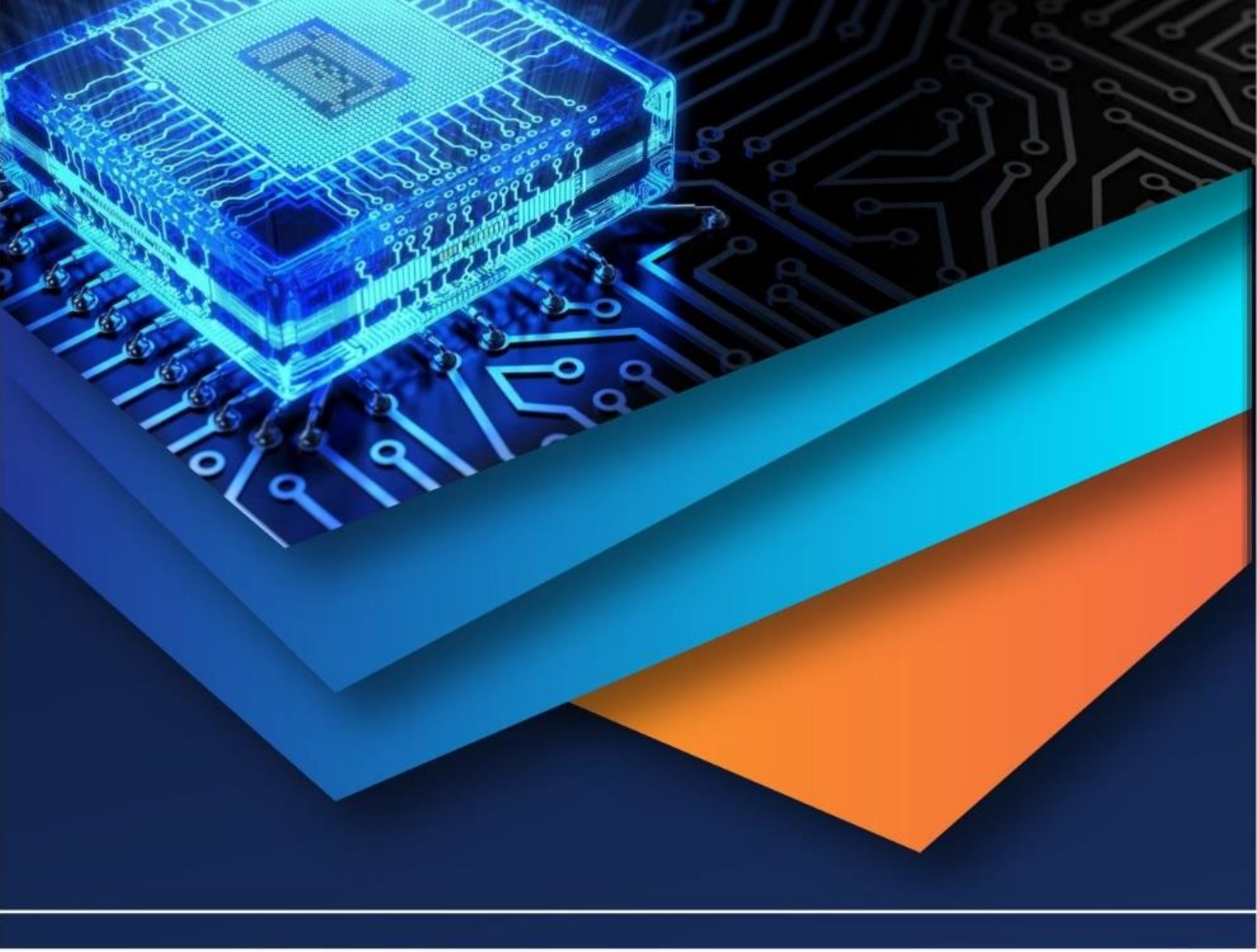

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