

## GPRS based smart shopping system

<sup>1</sup>CH.Iswarya, <sup>2</sup>Mr.A.M. Guna sekhar

<sup>1</sup>M.tech student, <sup>2</sup>Assoc. Professor,

<sup>1</sup>Department of ECE,

<sup>1</sup>Sree Rama Engineering College, Tirupati, India

### Abstract:

Generally, the people are going to markets and malls for buying the products for their daily requirement. Nowadays there are so many people are going to the malls and markets. Whenever, the people select their products and then going to take the bills in the malls. At the bill counter side, there are so many customers are wait in the long queues. This will makes the waste of time. To eliminate this time wasting process, we are develop a project i.e., 'Smart Shopping cart' using RFID. It is utilized help to a person while enquiring and furthermore to eliminate the waiting in long standing queues and also saving the time. This system can have an RFID Reader with RFID cards, switches, Arduino microcontroller board and LCD.

Each and every product in the marts and malls can have an RFID tag to retrieve the information about the product. At the point if a product can be placed in front of the RFID reader, then it will read the product ID and then press one for unavailable data find with it and will be stored in the Arduino controller. Here, we can use the other RFID card (membership card) for billing. Finally, the total amount of all products can be calculated, that amount can be deducted from the membership card and the cost details will be sent to customer phone through GSM. The items name and its rate can be declared by making use of headset. At the bill Counter side, the aggregate invoice records may be transferred to PC by communication modules.

**Keywords:** RFID Reader, IoT ,

### Introduction:

Nowadays, buying the products at malls and markets are turning into an everyday action in towns and urban communities. People purchase numerous things in the shopping centers and markets and place them in trolley. After total get one needs to go to bill

counter for paying amount. Where the cashier set up the bill utilizing barcode system per each user which is a tedious system and results in long queues at charge counters.

The aim of the project is to develop a system that can be employed as a part of malls and supermarkets to clarify the earlier mentioned challenge. The system can be place in all the trolleys and it requires an RFID reader. All products or items in the mall and supermarkets will be equipped with the RFID tags. Whenever the item or product set down in the trolley, then its code can be read and the price and amount of all items will be stored in memory. As we set down the items, the price and amount will get added to total bill. Thus the billing-process will be done in the trolley itself automatically. Name and cost of the item will be displayed on LCD.

### Existing System:

In the Existing system, the rate of the products is only displayed on the LCD with the help of the RFID module and IR Sensor. If the user has been completed his shopping the total amount can also calculated and displayed on the LCD itself.

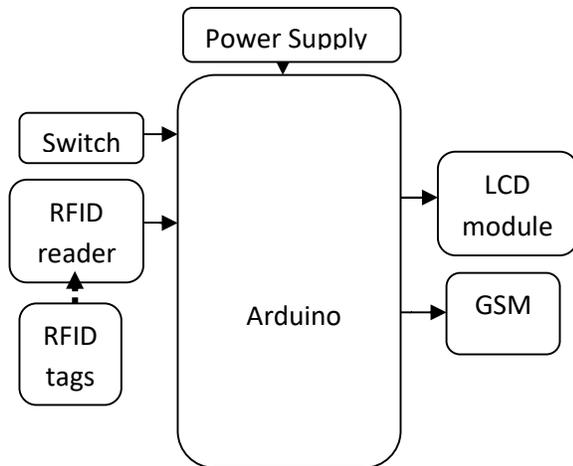
### Disadvantages:

- ✓ No Billing is given.
- ✓ The placement of the product between sensors is difficult.
- ✓ Identification of the product is difficult.

### Proposed System:

In the Proposed System we have executed the system efficiently to exchange the Data Successfully to the Billing Session. In this System we are utilizing RFID Reader and Zig-Bee to Data Transferring.

**Block diagram:**



**Fig1: Block diagram of the system**

**Hardware requirements:**

**Power Supply:**

**Transformer:**



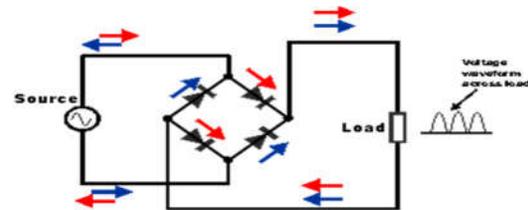
**Fig2: Block diagram of the system**

Transformer is a device which is used to step down the input ac voltage.

**Bridge rectifier:**



**Fig3: Bridge rectifier**



**Fig4: Bridge rectifier circuit**

Bridge rectifier circuit is used to convert the AC voltage to pulsating DC voltage.

**Capacitor:**

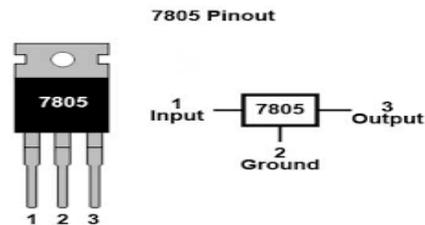


**Fig5: Capacitor**

Filters are many types i.e., inductive, capacitive, RL, LC, pi filters etc.,

Here, we are using the capacitive filter to remove the ripples of AC components.

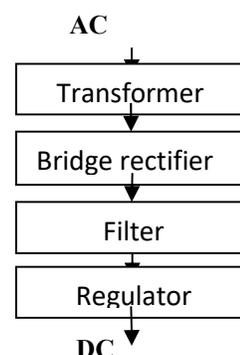
**Regulator:**



**Fig 6: Regulator**

It is an electronic component which is used to convert the AC voltage to standard DC voltage. Here, we are using 7805 IC for 5 volts of output.

**Flow chart of power supply:**



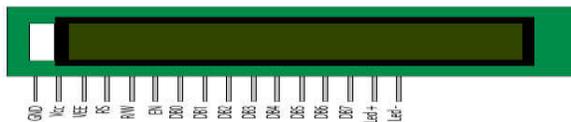
**Fig7: power supply**

All the above components are used to convert AC voltage to DC voltage.

**LCD:**

Here we are using 16\*2 LCD (liquid crystal display) which means 16 columns and 2 rows. The LCD can be works in two modes: 1). 4-bit mode and 2). 8- Bit mode.

**Pin Diagram:**



**Fig8:LCD**

**GSM MODULE:**

GSM module is used for sending and receiving messages by using AT commands.

**AT Commands:**

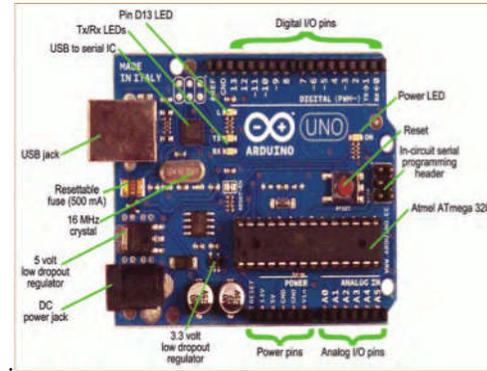
- AT commands are used for to control GSM module.
- AT refers to Attention.
- “AT+CMGF = 1” – To Set GSM mode.
- “AT + CMGS” – To send SMS message.
- “CTRL + Z” – Sending option.



**Fig9:GSM module**

**ARDUINO UNO**

Arduino UNO is ATMEGA38 controller has 14 for digital connectivity, 6 analog pins for analog interface, a 16 mega hedge crystal oscillator frequency, USB connectivity, a power connector, an ICSP header, and a reset get.



**Fig10: Arduino micro controller**

**Arduino Board:**

The Arduino board has input/output pins. It has pins from 0 to 13 that can be used as digital input from Switches A0-A6 as analog pins. In this PWM pins are there 3, 5, 6, 9, 10, &11.

**Features of Arduino Microcontroller:**

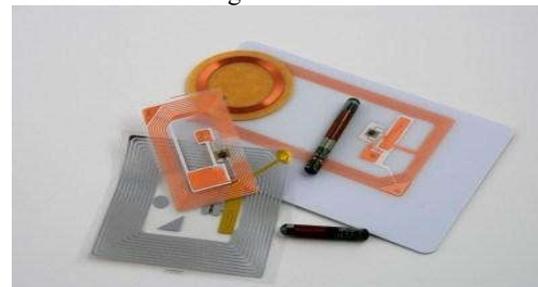
Most executable guideline is single clock cycle

- At 20 Mega hedges it has this throughput up to 20 Million Instructions/Second
- It will get reset when power on.
- It internal Oscillator

For serial communication here in this Arduino Board has pins 0, 1 are serial communication port pins.

**RFID module:**

This is a tracking technology which is used to detect and verify the tags that are tagged to any product. The RFID (Radio frequency Identification and Detection)is a standard term used for smart technologies that influence utilization of radio waves to determine the things and individuals.



**Fig11: RFID tags**

**Software requirements:**

To program the Arduino (make it do what you want it to) you also use the Arduino IDE (Integrated Development Environment), which is a piece of free software, that enables the program in the language that the Arduino understands. In case of the Arduino language is C. The IDE enables you to write a computer program, which is a set of step-by- step instructions that you then upload to the Arduino.

**WORKING OF THE PROJECT:**

The working of the project is simple to examine and designation process is easy. If chosen item is put on the trolley, the RFID reader scans the tag information of the product for picking the amount and cost of the product. The Price and Quantity Data is particularly traded to the LCD by including each product with price. If a product can be separate from the trolley, then the price and amount of the separated item can be decreased from the total amount. In the wake of finishing the whole shopping essentially tap on the completed the entire bill is forward to the billing section.

**APPLICATIONS:**

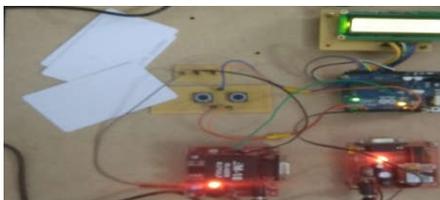
- Shopping malls
- Super markets
- Industries

**ADVANTAGES:**

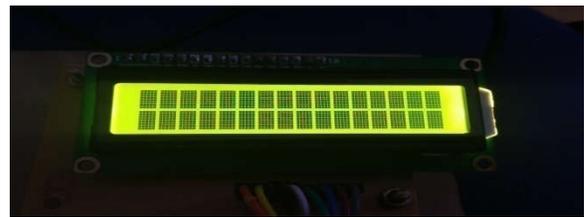
- Easy to handle
- Smart Usage
- There is no waiting

**Results:**

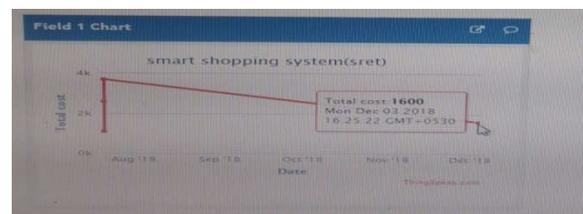
It consists of Arduino microcontroller, RFID Reader, LCD Display, GPRS. When switched ON the System, initially the LCD displays “WELCOME SMART SHOPPING “.

**Fig12: hard ware setup of the project**

The RFID Reader reads the Tag information on the product and displays the name of the product and cost of the product in the LCD display. It also displays the total amount of the products. Figure 13 and 14 displays the product name and cost as shown below.

**Fig13:** Displayed product name and cost**Fig14:** Total cost of the project on LCD

By using the GPRS the cost is updated to server as shown in below fig15.

**Fig15:** cost displayed in server**Conclusion:**

Hence, from the proposed technique we have designed and explained the Smart Trolley and it's working. With this innovation, we can get the basics

about the shopping which we are doing and it looks Smart for Usage.

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