

Cloud Based Secure e-cart for Automatic billing using RFID and Zigbee

Major project report submitted in partial fulfilment of the
requirement for the degree of Bachelor of Technology

in

Computer Science and Engineering

By

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UNDER THE SUPERVISION OF

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **(Dr. Pradeep Kumar Gupta , Associate Professor)** Jaypee University of Information Technology. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

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CERTIFICATE

This is to certify that the work which is being presented in the project report titled “**Cloud based Secure e-cart for Automatic billing using RFID and Zigbee**” in partial fulfilment of the requirements for the award of the degree of B.Tech in Computer Science And Engineering and submitted to the Department of Computer Science And Engineering, Jaypee University of Information Technology, Waknaghat is an authentic record of work carried out by Ishaan Kotwal (181386) during the period from January 2022 to May 2022 under the supervision of **Dr. Pradeep Kumar Gupta**, Department of Computer Science and Engineering, Jaypee University of Information Technology, W aknaghat .

Ishaan Kotwal 181386

The above statement made is correct to the best of my knowledge.

Dr. Pradeep Kumar Gupta , Associate professor
Computer Science & Engineering and Information Technology
Jaypee University of Information Technology, Waknaghat,

ACKNOWLEDGEMENT

Firstly, we express our heartiest thanks and gratefulness to almighty God for his divine blessings makes it possible to complete the project work successfully.

We are really grateful and wish our profound indebtedness to Supervisor **Dr. Pradeep Kumar Gupta , Associate Professor** , Department of CSE Jaypee University of Information Technology,Wakhnaghat. Keen interest of our supervisor in the field of “**Cloud based Secure e-cart for Automatic billing using RFID and Zigbee**” along with his deep knowledge helped us to carry out this project efficiently. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stages have made it possible to complete this project.

WE would like to express our heartiest gratitude to **Dr. Pradeep Kumar Gupta , Associate Professor** Department of CSE, for his kind help to finish our project.

We would also generously welcome each one of those individuals who helped us straightforwardly or in a roundabout way in making this project a win. In this unique situation, we might want to thank the various staff individuals, both educating and non-instructing, who have developed their convenient help and facilitated our undertaking.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

Ishaan Kotwal 181386

ABSTRACT

With the headway in innovation, there's an unexpected float of individuals from varying backgrounds towards specialized contraptions. With the progression, there comes cutoff times and time limits to tolerate. These days there's a prerequisite of saving time any place we can. Shopping edifices are where we carve out individuals all the opportunity, subsequently these makes phone call for a more significant level of progression and infrastructure. To make shopping encounters somewhat less unwieldy and more smooth without the hustle of remaining in lengthy lines to get your buy charged. Our venture expects to give a brought together and robotized charging framework utilizing RFID (radio recurrence sign innovation) and ZigBee correspondence. These RFID labels are appended to every item in the shopping market which simply should be just filtered and the thing gets put on your tab. We target saving your experience as well as it's a drive to advance "Credit only India" as the bill installments can be made by RFID ATM cards, sending a synopsis and affirmation to your enrolled versatile number right away. Hence it's essentially a creation to save your time and bring in your cash exchanges simpler..

CHAPTER 1 :- INTRODUCTION

In the current time, each individual going out for shopping, first invests his energy gathering different things according to his need and afterward trusting that his turn will get to pay for every one of the things he bought. This is a tedious interaction which can be adjusted. Shopping edifices are where we set aside individuals all the opportunity, in this manner these makes phone call for a more significant level of headway and infrastructure. To make shopping encounters somewhat less lumbering and more smooth without the hustle of standing in lengthy lines to get your buy charged. The primary motivation behind our task is to give an incorporated and computerized charging framework using RFID and Zigbee correspondence to serve our necessity of saving time. The exposure to RFID makes the traditional or obsolete retail process speedier, straightforward and productive. Every item in the shopping center will be provided with a RFID tag to recognize its sort and each truck will contain a board. The board contains an Arduino board, LCD show, RFID peruser, Zigbee module, GSM module, Buzzer keypad. The centralized data set will give the item data on the LCD screen present on the shopping basket and It'll make the charging system quicker and smoother with much less botheration.

Centralized Billing system Representation



Fig 1 – Central automated billing system

1.1 MOTIVATION

Nowadays, everything is getting digital. Gone are those days where everyone used to go to shopping malls to buy products while standing in a long queue, now everything is just a click away. While discussing about this with my friend we came to a conclusion to work on such a project to understand the inner workings of how a data is classified and the product becomes a hit or not.

Since we are extremely interested in everything having a relation with cloud computing and IOT, this independent project was a great opportunity to give me the time to learn and confirm my interest for this field. The sole fact that one can make estimations, predictions and give the ability for machines to learn by themselves is powerful as well as limitless in terms of application possibilities.

CHAPTER 2 :- LITERATURE SURVEY

1. Smart shopping cart with automatic billing system through RFID and ZigBee

Mr. P. Chandrasekar and Ms. T. Sangeetha

This application makes a computerized focal charging framework for the shopping center. Clients can cover their bills through credit/charge cards . Zigbee and RFID are utilized in it.

Radio recurrence distinguishing proof (RFID) innovation may not exclusively be helpful for smoothing out stock and supply chains: it could likewise make customers swarm. ZigBee devices frequently transmit information over longer distances by going information through halfway gadgets to arrive at additional far off ones, making a lattice organization; i.e., an organization with no unified control or high-power transmitter/recipient ready to arrive at all of the networked gadgets.

This paper gives brought together and mechanized billing framework utilizing RFID and ZigBee correspondence. Every result of shopping center, grocery stores will be given a RFID tag, to distinguish its sort.

Each shopping basket is planned or carried out with a Product Identification Device (PID) that contains microcontroller, LCD, a RFID peruser, EEPROM, and ZigBee module. Buying item data will be perused a RFID peruser on shopping basket, mean while product data will be put away into EEPROM appended to it and EEPROM information will be ship off Central Billing System through ZigBee module

2. Novel Model for Automating Purchases using Intelligent Cart

Ms. Vrinda and Ms. Niharika

This paper gives a thought of LCD utilized for offers, limits and complete bills.

The present client has a more profound understanding in comparing item costs;

has incredible assumptions in administrations and client regard. RADIO FREQUENCY IDENTIFICATION (RFID) innovation certifies acknowledgment and connection of an article to an extraordinary recognition code on the RFID label appended on the item.

RFID and wireless organizations are arising innovations, making the regular retail process quick, undeniable, straightforward and viable. This innovation addresses to retailers an opportunity to diminish costs and to improve administrations, allowing

to go to customers quickly and giving customized administrations.

The really innovative hold back nothing model is utilization of RFID innovation for the programmed item acknowledgment inside the truck, in this way canceling client intercession in the strategy of thing perusing for installment. These days, the utilization of standardized identification for ware location presents a few shortcomings: data is static, grants each single perusing in turn, involves view, low reach and security. RFID innovation is more secure, can give different sorts of data, can make simultaneous readings, with no need view. Broadening these ideas, it conceivable to frame a framework that naturally order each thing, likewise robotizing buys and dispensing with the long lines and boosting time proficiency.

The model of a canny shopping basket (implanted framework) is introduced which can be utilized in supermarkets and shopping centers to tackle the current issues. The intelligent Shopping Cart is enriched with Radio Frequency Identification (RFID) reader for item acknowledgment and a tag so this truck can be distinguished. Additionally, it likewise has a LCD display that tells the clients about thing costs, offers, limits and the complete bill. When the thing is dropped into or taken out from this shrewd truck, the peruser identifies the tagID of item and the particular cost of the thing and updates the bill. At the point when the client has finished purchasing stuff, he can look at subsequent to taking care of the bill without the need to remain in lines. This proposed model is effectively adaptable, vigorous and requires no exceptional training. The savvy truck's programmed charging framework makes shopping a sinecure as it liberates the staff from drawn-out checkout examining, decreasing all out number of worker's required and raising functional viability of the framework. In this paper, the model introduced considerably brings down the upward of the previous proposed models.

3. The RFID based Smart Shopping Cart

Ms. Rupali Sawant, Kripa Krishnan, Shweta Bhokre and Ms, Priyanka Bhosale

This paper gives a thought of involving a portable for covering the bill by means of various versatile applications.

The design execution of the framework and the principal end of the framework is to permit the shopper a new improved approach to shopping. The typical shopping experience till date, after the develop of different stores is: enter the store, take a streetcar and push it around the whole store looking for the items required, load them into the streetcar, stand in line, cover the bill, exit from store. From the proposed model, the use of RFID appreciates benefits, for example, resulting decrease in item cost, reduced human mediation and work cost, accessibility of getting to the ongoing data about the assorted items inside the shopping cart.

Each RFID framework the transponder Tags contain data. Data can be just about as

little as a solitary parallel piece, or enormous cluster of pieces like a character code, individual clinical data, or in a real sense any sort of data that can be put away in advanced twofold arrangement.

Peruser generates RF transporter sine waves. When tag gets adequate energy, Tags yield semiconductor shunts the curl relating to the information being taken off of memory cluster Reader performed advanced information encoding.

4. Electronic Shopping Cart for Effective Shopping based on RFID

Ms. Kalyani Dawkhar, Shraddha Dhomase and Ms. Samruddhi Mahabaleshwarkar

This paper concludes that the time expected for charging in the shopping centers is chopped down in self checking.

In various sort of businesses the electronic gadgets like shrewd card peruser, standardized identification and RFID scanner having more usage. This sort of devices likewise expected in grocery stores. In the current, in the shopping center each individual takes item put into streetcar.

After the shopping is done that individual need to remain in the line for charging. In the charging system a sell individual output standardized tag yikes every single item and gives last bill. This cycle is exceptionally tedious and it turns out to be most awful on siestas, extraordinary offers or ends of the week. To conquer that we have been fostered a savvy way for shopping in shopping centers. Every single item has RFID tag instead of scanner tag.

The smart streetcar will have RFID peruser, LCD show. At the point when an individual put any item in the streetcar it will examine and the expense, name and lapse date of the item will show. Cost will add into definite bill. Bill will be put away in microcontroller memory. It will move from RF transmitter to RF recipient. Recipient will move this data to the PC through serial correspondence.

5. RFID based Smart Shopping and Billing

Zeeshan Ali and Reena Sonkusare

In this paper, more use of LCD like eliminating the molecule by drop button on LCD executed.

Radio Frequency Identification (RFID) is becoming ideal innovation as an alternative to standardized tag frameworks. RFID frameworks provide a programmed recognizable proof strategy, depending on putting away and remotely recovering information utilizing RFID labels or transponders. A RFID tag is an item that can be joined to or integrated into an item, creature, or individual with the end goal of ID utilizing radio waves. Chip-based RFID labels contain silicon chips and

radio wires.

In this paper, we have fostered a brilliant shopping basket framework that permits clients to deal with their shopping list while shopping and just cover the bill at the checkout counter. The shopping truck can ascertain naturally and show the all out costs of the relative multitude of items inside it. This makes it simple for the client to know the amount of the person possesses to pay while shopping and not at the checkout counter. This way the client can get quicker administration at the checkout. The benefit for the retailers is that they would require a less clerks, which would bring about a huge cut in their expenses.

6. Intelligent Shopping Cart

Raju Kumar, K. Gopalakrishna and K. Ramesha

It clarify how for access constant data about the different item inside the shopping basket.

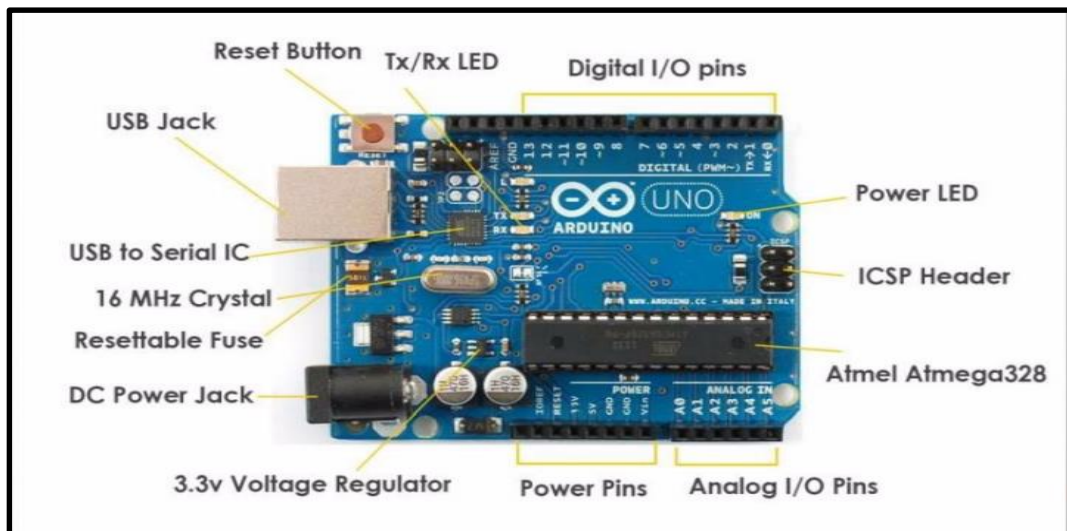
The principal objective of this is to give an innovation situated, minimal expense, effectively versatile, and tough framework for helping shopping face to face. The created framework comprises of 3 key parts/modules (a) Server Communication part (SCC) (b) User Interface and show part (UIDC), and (c) Automatic charging and Inventory the executives part (ABIMC). SCC lays out and keeps up with the association of the shopping basket with the primary server. UIDC gives the UI and ABIMC handles the charging and stock administration in relationship with the SCC.

These 3 modules are incorporated into an installed framework and are tried to fulfill the usefulness. The super innovative goal for our introduced arrangement is the use of RFID innovation for the programmed item ID inside the shopping basket in this way disposing of shopper mediation during the time spent item perusing for installment. These days, the utilization of standardized tag for item recognizable proof presents a few restrictions: just the product's class is distinguished; data is static; permits each single perusing in turn; requires view; has low reach and security. RFID innovation is more safe, more secure, distinguishes items in a novel way, can give different kinds of data, can make a few synchronous readings, doesn't need view and it has a high reach. So programmed item recognizable proof is conceivable all current items inside the grocery store should be related to RFID labels and each shopping basket should have a RFID peruser. The scope of the RFID peruser should not stretch out past the flat shopping basket restricts so that perusing items inside other shopping baskets or on racks doesn't occur. In any case, range can't be not exactly as far as possible with outcome of not recognizing items that are inside the shopping basket yet out of the reader's range.

CHAPTER 3:- SYSTEM DEVELOPEMENT

3.1 HARDWARE USED

- **Arduino Uno**



(Fig 2 – Arduino Uno)

- **Arduino Uno Board Description**

Microcontroller	: ATmega328
Operating voltage(USB cable)	: 5V
Input Voltage (power jack)	: 7-12V
Digital I/O Pins	: 14 (0 to 13 pins, of which 6 provide PWM output)
Analog Input Pins	: 6 (A0 to A5)
DC Current per I/O Pin	: 40 mA
DC Current for 3.3V Pin	: 50 mA
Flash Memory	: 32 KB (ATmega328)
SRAM	: 2 KB (ATmega328)
EEPROM	: 1 KB (ATmega328)
Clock Speed	: 16 MHz
Length	: 68.6 mm
Width	: 53.4 mm
Weight	: 25 g

- **RFID TAGS**



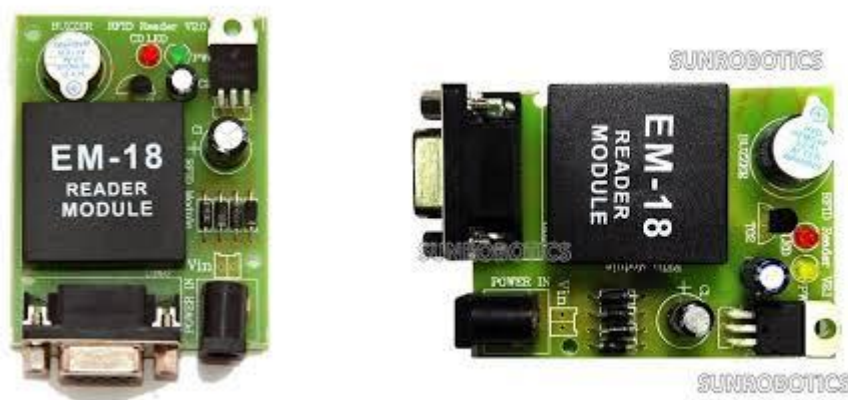
(Fig 3 – RFID TAGS)

RFID tags consist of 3 key components, namely, an in-built chip, a substrate and an antenna.

A general RFID chip is capable of accumulating 96 bits of data but some other chips have a capacity of storing 1000-2000 bits.

Every RFID card has an unique ID number.

- **RFID Reader**



(Fig 4 – RFID Reader)

->The reader gives radio waves in ranges of anywhere from 1 inch to 100 feet or maybe even more, It basically depends on its power output and the radio frequency which is being used.

->When an RFID tag goes through the electromagnetic area, it detects the client's activation signal.

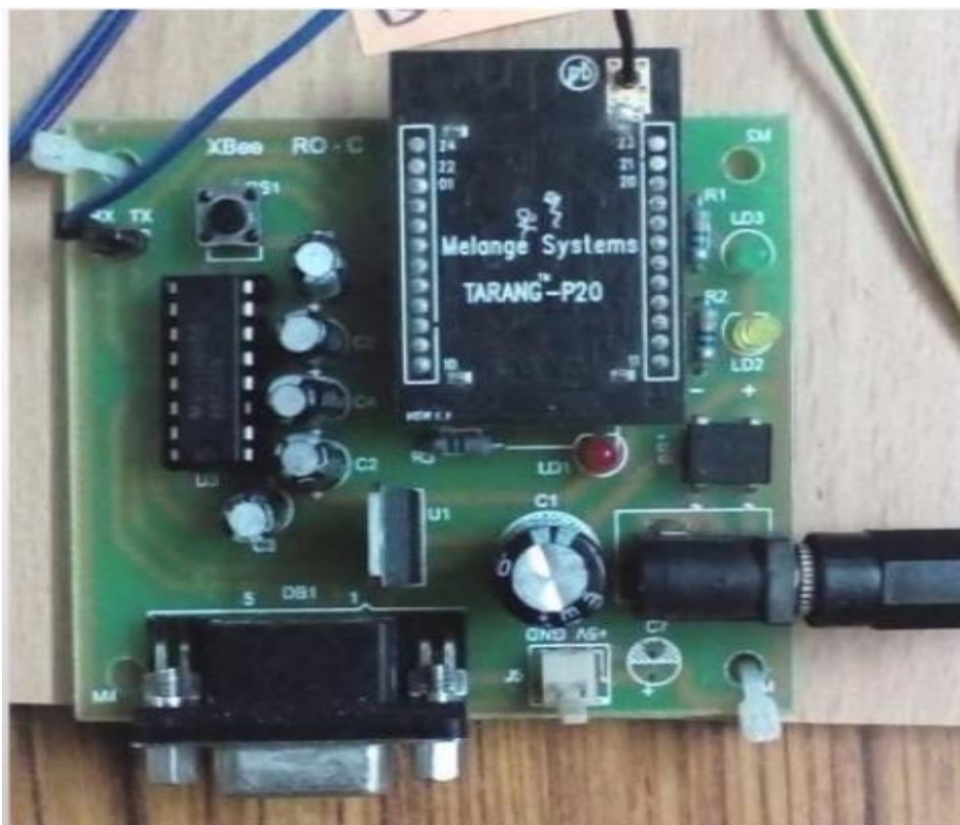
->Identification

->Plastic Cube

->Transponder

->Carrier Frequency: 125 kHz

- **Zigbee Wireless Module**



(Fig 5 – Zigbee Wireless Module)

-> **Zigbee** is a wireless **innovation** built as an open worldwide standard to address the distinctive needs of economical, low-power wireless IoT networks.

->It is a secure network technology.

-> The Range is 100m basically (5 to 500m based upon the surrounding).

-> Data rates of 250 kbps (2.4GHz).

Applications:

1. Home automation, smart lighting.
2. Industrial control
3. Embedded sensing
4. Medical data collection

● **Tarang P20 Module**



(Fig 6 – Tarang P20 Module)

-> Tarang-P20 modules are developed with minimum to maximum transmit power and it is also used for high reliability wireless networks.

-> It supports mesh/star topologies.

Specifications:

Operating Voltage 3.3V

Operating Frequency range is 2.4 GHz

Baud rate 9600bps

Zigbee Pro Complaint platform.

RF Data rate: 250 kbps.

● GSM(Global system for mobile communications)

-> It is used to interact with GSM networks using a computer. The GSM module only understands AT (Attention) commands.

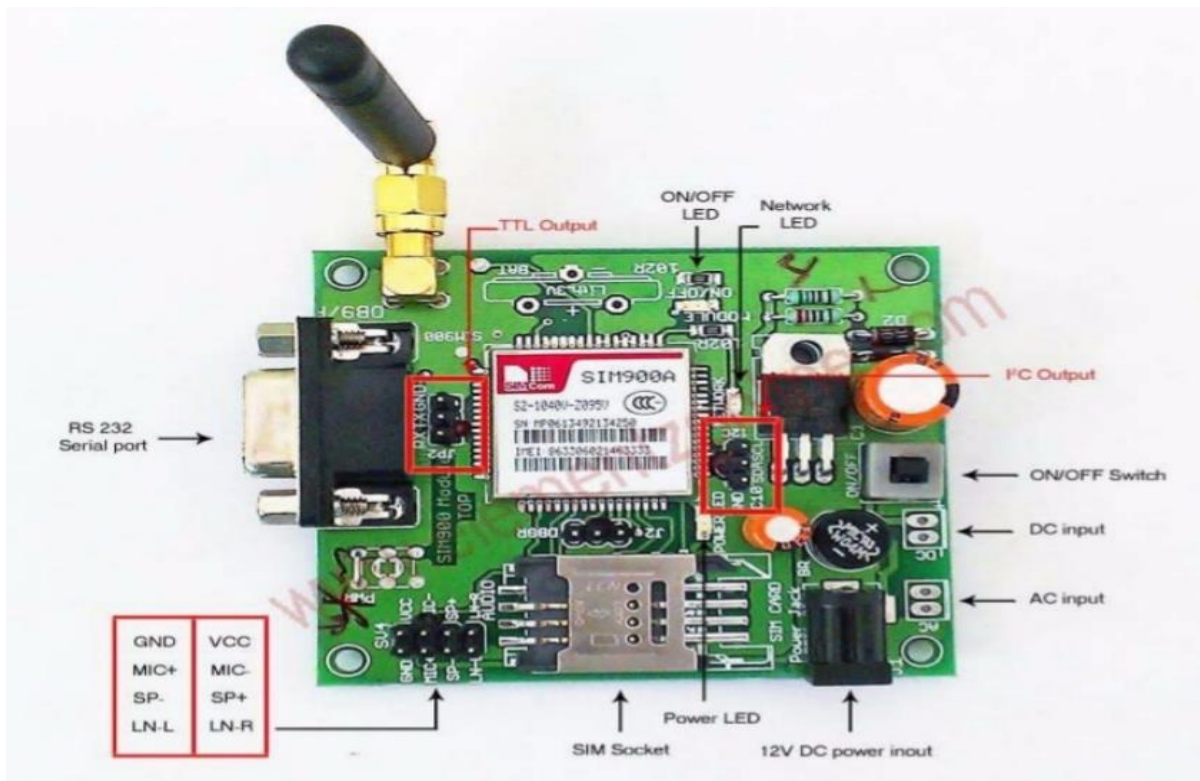
-> We use the SIM900 GSM Module. This module assists the communication in the 900MHz band.

-> In our major project, the GSM module requires a 12 volts input. So over here we are using a 12V, 1A DC power supply.

-> GSM can be considered as a phone for better understanding of the concept

-> Baud rate: 9600bps

The purpose of the GSM module in this project is to send the SMS to customers when they choose bill payment by ATM card.



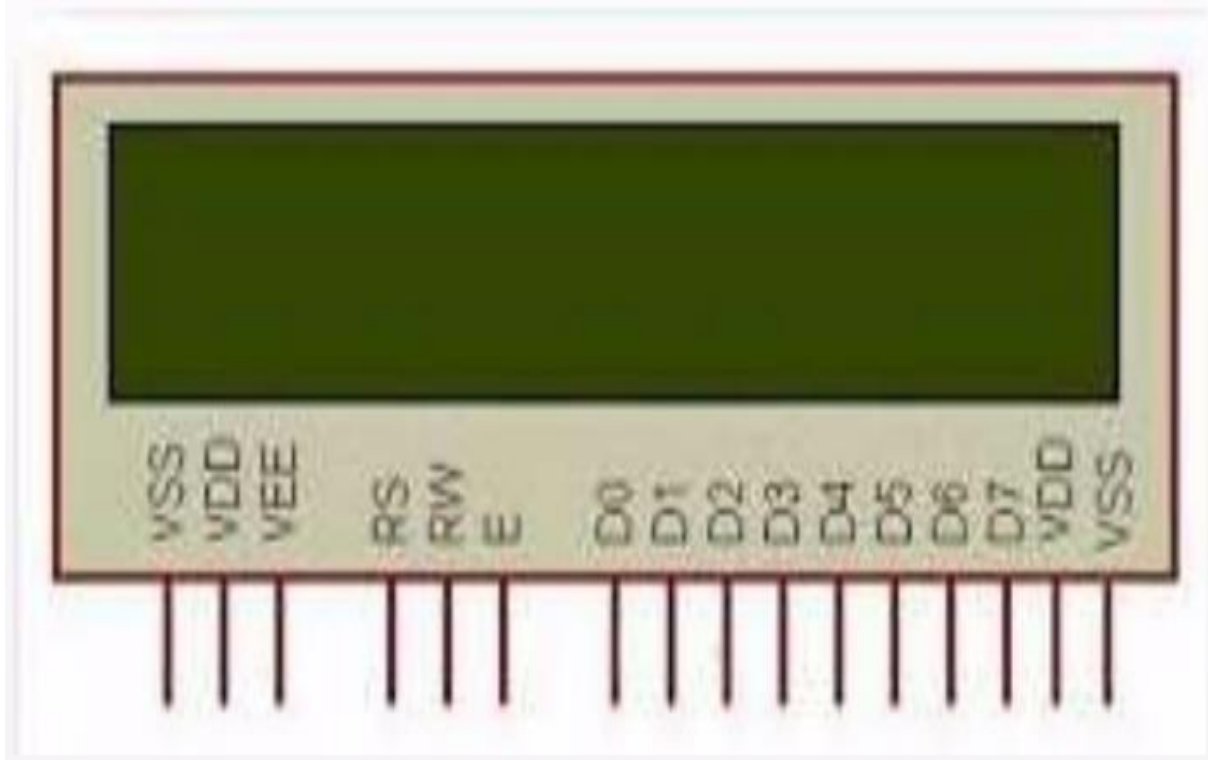
(Fig 7 – GSM(Global system for mobile communications))

- **LCD (Liquid Crystal display)**

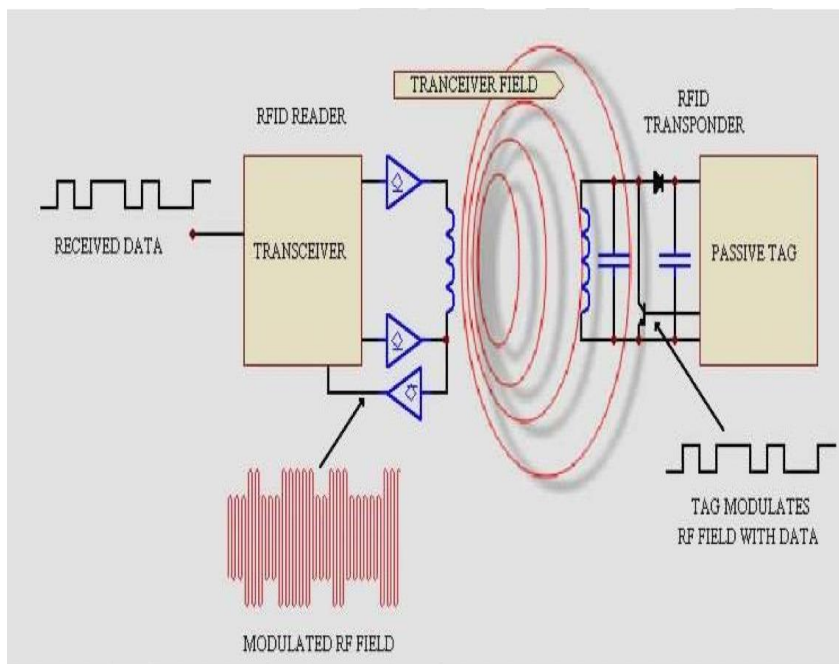
The 16x2 LCD module has a set of commands each meant for doing a particular job with the display.

Data pins are D0-D7, to use pins effectively we are using D4-D7 which are connected to an Arduino board.

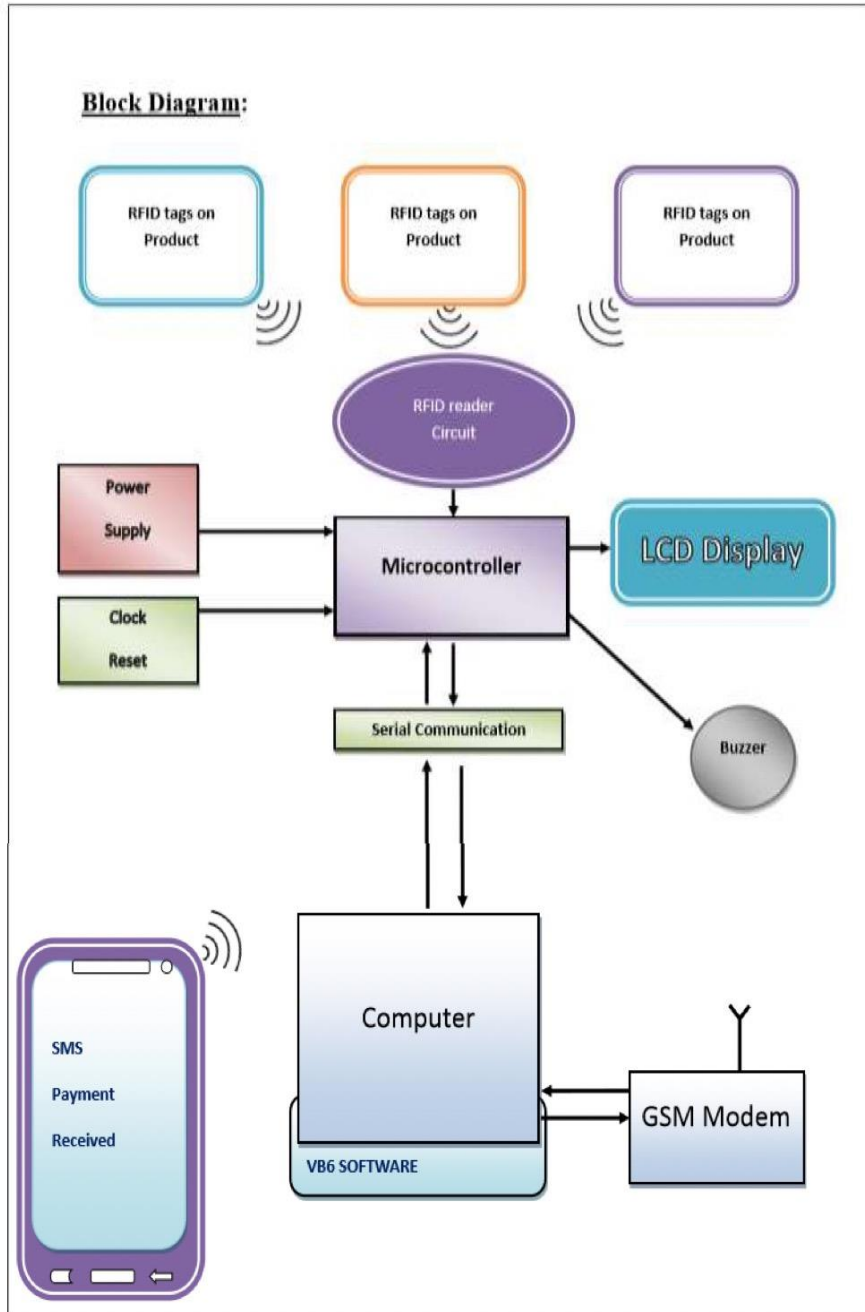
LCD displays are used in our project to display product names and cost for each item. It also used to display the payment options.



(Fig 8 – LCD (Liquid Crystal display))



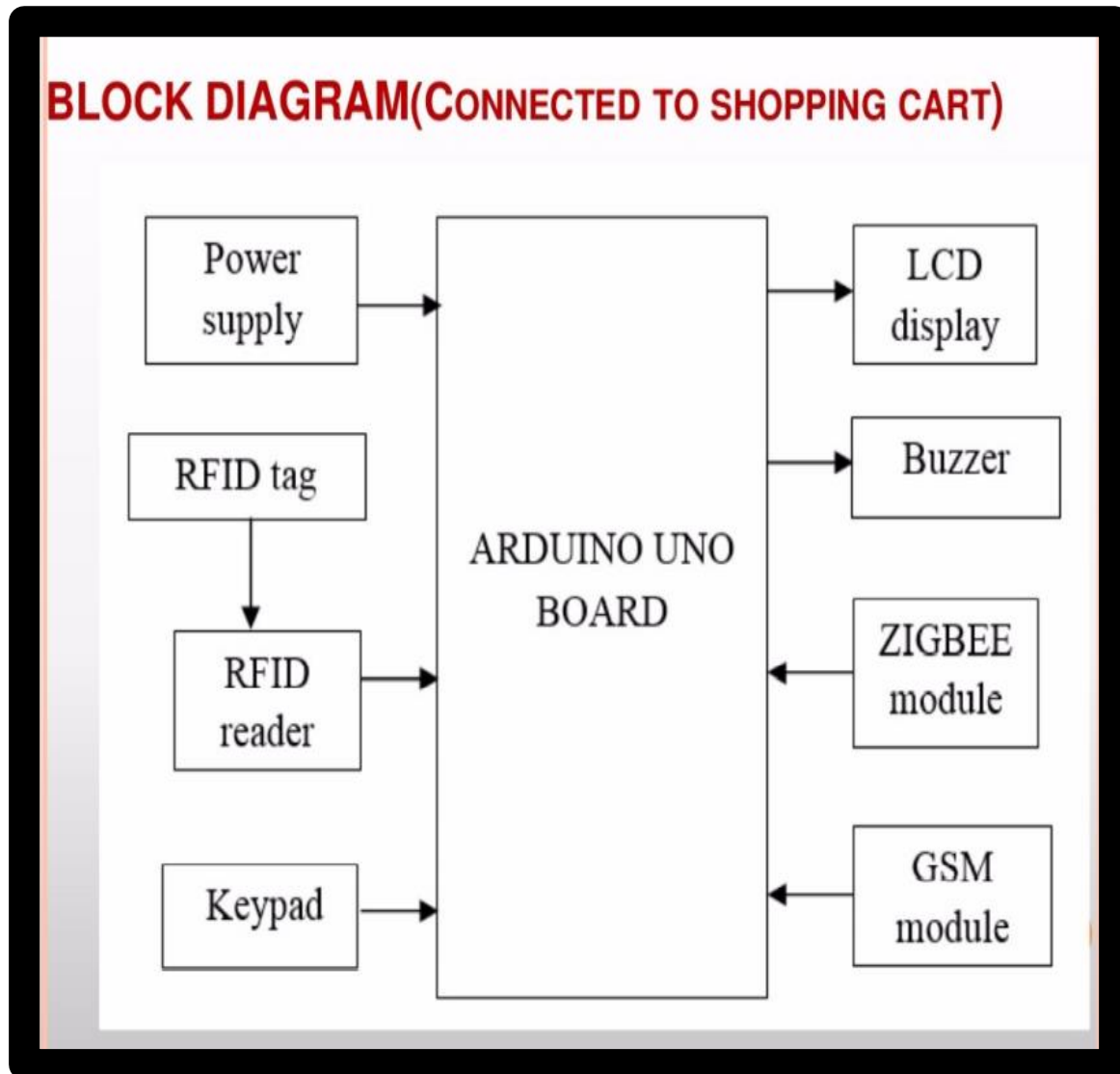
(Fig 9 – Functioning of RFID)



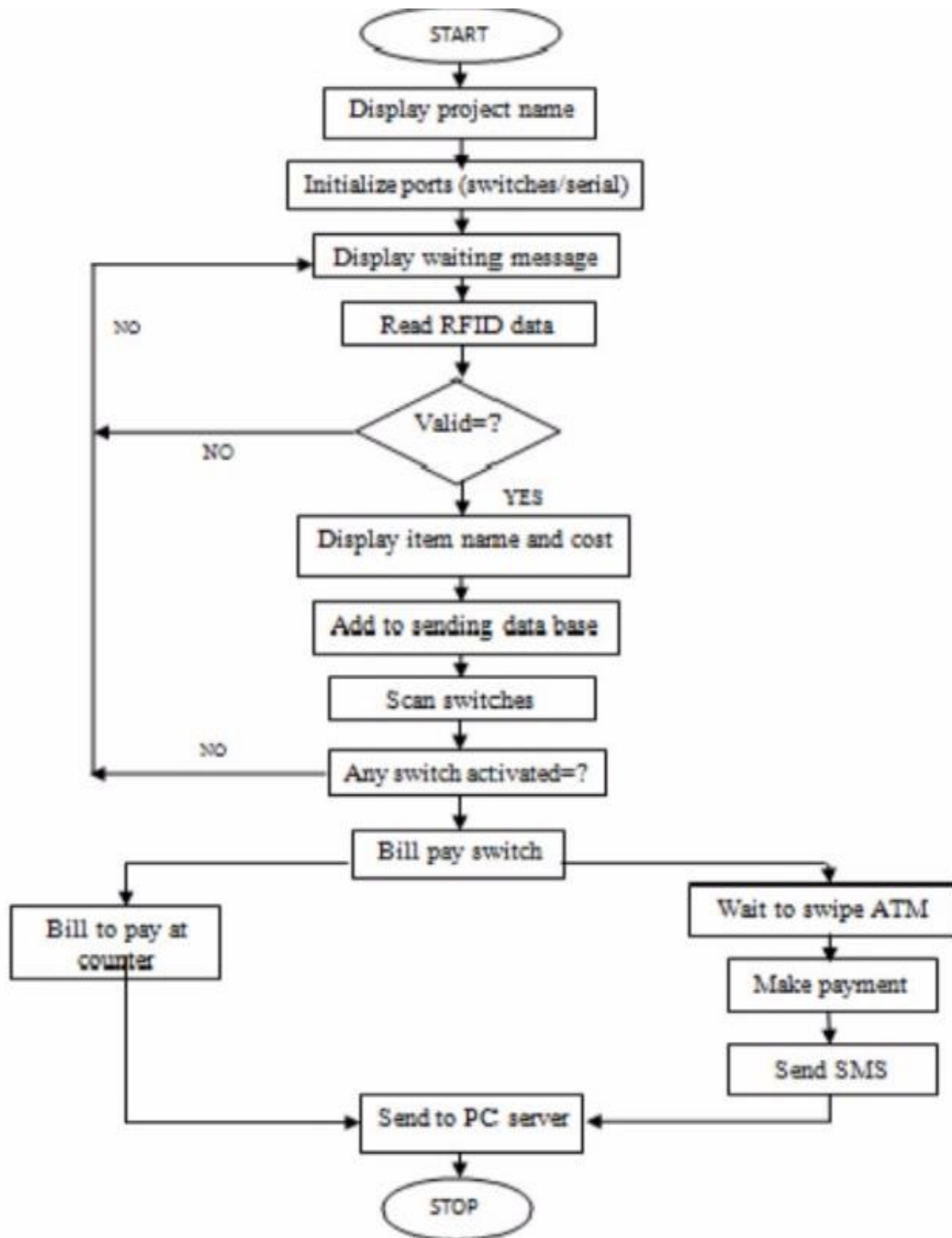
(Fig 10 – Block Diagram of the Ecart System)

3.2 IMPLEMENTATION OF PROJECT

- **BLOCK DIAGRAM OF THE ECART**



3.3 ALGORITHM OF THE PROJECT



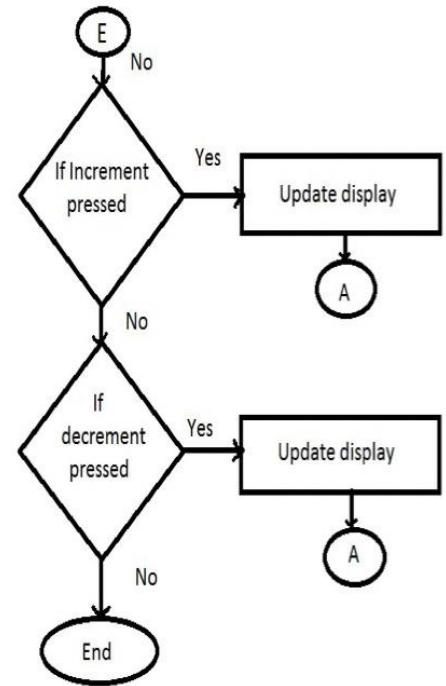
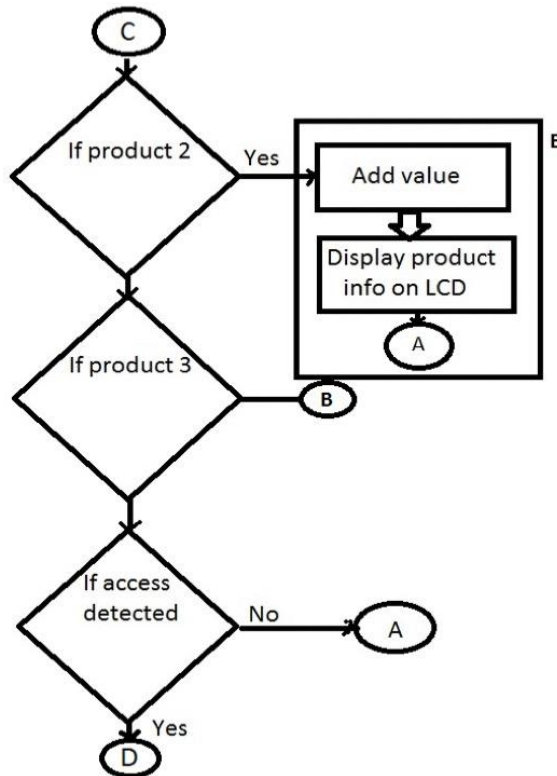
(Fig 11 – Algorithm of the Project)

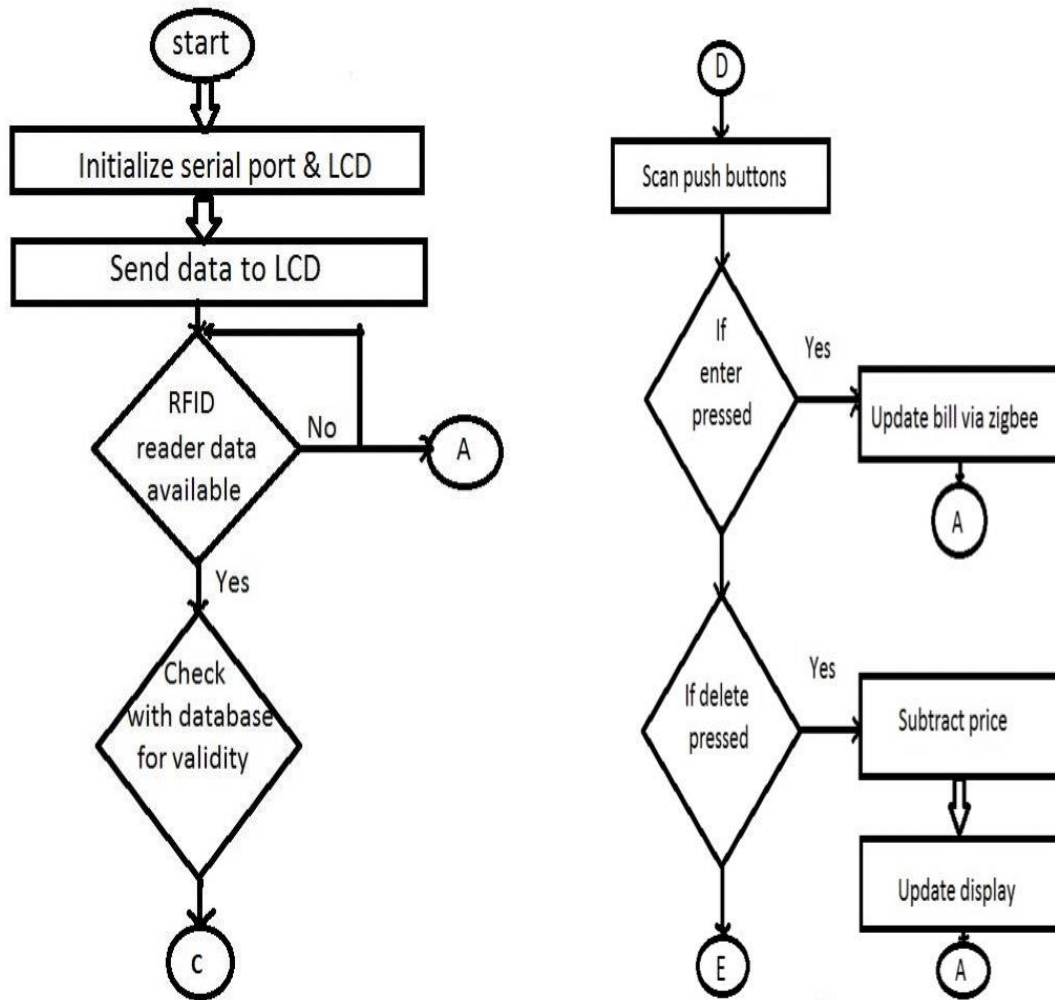
Table III. Comparison between BARCODE & RFID system

BARCODE (existing technology)	RFID (proposed technology)
a) Person is required to read barcode on product. b) Barcode must be visible on the surface of product. c) Line of sight required to a read barcode. d) The readability of barcodes can be impaired by dirt, moisture, abrasion, or packaging contours e) Short reading distance. f) Barcode does not have READ & WRITE capability.	a) Automatic reading of RFID tag from product. b) RFID can be placed inside the product. c) No line of sight required to read RFID. d) RFID tags are not affected by such conditions. e) Long reading distance. f) RFID tag having READ & WRITE capability.

Table IV. Comparison between existing system & proposed

Existing system	Proposed system
a) Manual billing. b) Use barcode for billing c) human staff is needed for billing d) Low product cost but overall expenses are much high. e) Difficult to track the product. f) Getting product information is difficult & time consuming. g) It does not disclose any automatic way of indicating to the shopper how the total bill is affected as objects are added or removed from the cart.	a) Automatic billing b) Use RFID TAG for billing c) No need of any staff for billing d) Product is little expensive but overall expenses is much low e) Easy to locate/track the product f) Getting product information is easy and no extra time needed. g) LCD display is present which will show the updated bill every time the shopper add or remove any object from the cart.





(Fig 12 – Flowchart of the algorithm)

Chapter 4 :- Performance Analysis

4.1 FEASIBILITY STUDY

An achievability study is supposed to be a primer report which investigates the subtleties of forthcoming clients and determines you assets requirements, expenses, government assistance and feasibility of the proposed framework. It takes under consideration, every one of the limitations inside which the execution and ooperation of the framework happens. In this stage, the assets needed for the execution like processing hardware, manpower and costs are estimated. The assessed assets are compared with the available resources and a money saving advantage analysis of the system is finished. The feasibility analysis action includes the analysis of you issue and afterward collecting all important data connected with the pproject. The main objective of the achievability study is to decide if the project would be feasible as far as economic possibility, technical feasibility aand operational attainability and schedule feasibility or not. Additionally, to make sure that the input information which is expected for the undertaking is accessible.

Thus, we have assessed the practicality of the framework into the accompanying classes:

- Technical achievability
- Operational achievability
- Economic achievability
- Schedule achievability

4.1.1 TECHNICAL FEASIBILITY

The assessment of specialized plausibility is a precarious part the it comes to of a feasibility study. This is because, at this point in time there isn't any point by point designed yikes the ssystem, making it difficult to get to issues like performance, ccosts (by virtue of the sort of innovation to be conveyed) and so on. Various issues should be considered while doing a specialized analysis; understand the different innovations utilized inside the proposed framework. Prior to commencing the venture, we must be extremely clear about what are the technologies that are expected for the development of the new framework. Regardless of whether the required technology is available? Our framework is in fact feasible since every one of the expected instruments are effectively available. Albeit all apparatuses that seem to be easily accessible come with challenges as well.

4.1.2 OPERATIONAL FEASIBILITY

Proposed project is valuable the length of it very well may be transformed into data frameworks that will meet the requirements of the operation. In simpler terms, this trial of feasibility asks whether the framework will work when it is developed and introduced. Are there major boundaries to Implementation? The proposed is to shape a simplified web application. It is more straightforward to work upon and can be used any site pages. It is free and not exorbitant to operate.

4.1.3 ECONOMIC FEASIBILTY

It endeavors to gauge the expenses of creating and executing another framework, against the advantages that would increase throughout some stretch of time from having the new system set up. This feasibility study done for the new framework gives the top management the economic avocation. A straightforward financial examination wwhich gives the genuine comparison of costs and benefits are undeniably more meaningful for this situation. Moreover, this ends up being a helpful mark of reference to differentiate genuine expenses as the project progresses. There could be various theoretical benefits by virtue of automation. These

could increase improvement in product quality, better dynamic ability, and idealness of information, facilitating exercises, improved accuracy of operations, better documentation and record keeping, quicker retrieval of the information. It is a web based application. It isn't exorbitant to Create the application.

4.1.4 SCHEDULE FEASIBILITY

A task is fundamentally of no utilization in the event that it takes too lengthy to possibly be finished before it becomes valuable. Ordinarily, this is about assessing the way in which long the framework will take to develop, and whether or not it very well may be finished in a given timeframe utilizing some methods, for example, payback period. Plan possibility is a measure how reasonable the venture schedule is. Given our specialized mastery, are the deadlines given for the task, reasonable? Some pproject is start with explicit cutoff times. It is important to sort out whether the cutoff times are required or alluring. A minor deviation can be encountered in the first timetable chose at the commencement of the undertaking. The application improvement is conceivable regarding plan.

4.2 Requirement Definition

After the extensive analysis of the issues faced within the system, we are familiarised with the needs and requirements of the current system. The requirement that the system needs is categorised into the functional and non-functional requirements. These requirements are listed below:

4.2.1. Functional Requirements

Utilitarian prerequisite are those capacities or highlights that should be remembered for any system to satisfy the business needs and be adequate to the clients. In light of this ddefinition, the functional prerequisites required by the framework are as per the following:

- Framework should have the option to pprocess new audits put away in database after recovery

- Framework ought to have the option to analyse information and group the extremity of each survey

4.2.2. Non-Functional Requirements

Non-practical requirements is a depiction of highlights, qualities and trait of the framework as well as any limitations that may limit the limits of the proposed framework. The non-useful requirements are basically founded on the exhibition, information, economy, control and security effectiveness and administrations. In view of these the non-utilitarian prerequisites are as per the following:

- Client friendly
- Framework ought to provide better exactness
- To perform with efficient throughput and reaction time

To additionally intricate, we can express the non utilitarian requirements based on the accompanying requirements:

- Performance

The response time of the application aimed not to exceed 10 seconds for each interaction. The first compilation of this much large dataset takes much time but over the time after compiling for several times, the system gets faster.

- Reliability

For any transaction, the system shall respond and should not result in failure. In the case of any failure, the user shall reattempt connection to the system and pass the reviews again.

- Availability

The system shall be available for the user for any reviews that the user tries to make with the review system. If the system doesn't provide polarity, the user shall reattempt to run the polarity code again.

- Security

- Maintainability

- Portability

The application will be independent of the underlying OS or hardware. The application only requires the presence of any

incorporated middleware and the databases used on the machine on which the application is being ported.

4.3 Disadvantages of barcode technology (Existing System)

1. Barcodes don't have read/compose abilities.
2. It needs optical view (LOS) scanning.
3. It is labor intensive in nature as it requires to be scanned separately.
4. Assuming we take a gander at security, it is very less secure as compared to RFID which can be easily hammered out.
5. Scratched or wrinkled barcodes may cause difficulties while filtering.

4.4 Advantages of RFID Technology(proposed System)

1. RFID tag and the RFID reader should not be necessarily in the line of sight to make the system work.
2. Unlike barcodes, tags can store more information. Moreover it follows commands or instructions of reader.
3. RFID technology is very flexible in its working and hence smaller and larger RFID devices are available as per application.
4. Tags can be used in a read only mode as well as "read/write" mode unlike barcodes.

4.3 WORKING PROCEDURE

Step 1

Switch on the power supply of the hardware kit. Connect the zigbee module to the computer with the help of USB cable. Open the library and select the COM port.

Step 2

The LCD screen in the hardware displays "welcome to trolley billing" after some delay in time it displays "waiting for the items" then add the items to the cart by keeping RFID card near the RFID reader then the product details will be displayed on the LCD screen

Step 3

After adding some of the items we can also delete a product/item by pressing the delete key in the keypad. Then the LCD displays a message "remove an item" then the item is removed

Step 4

After we have added the items to the cart, press the **save** switch. Now we will get two choices in the LCD screen "1. pay using ATM card and 2.billing". If you want to pay a bill using RFID ATM card press switch 1 otherwise press switch

Step 5

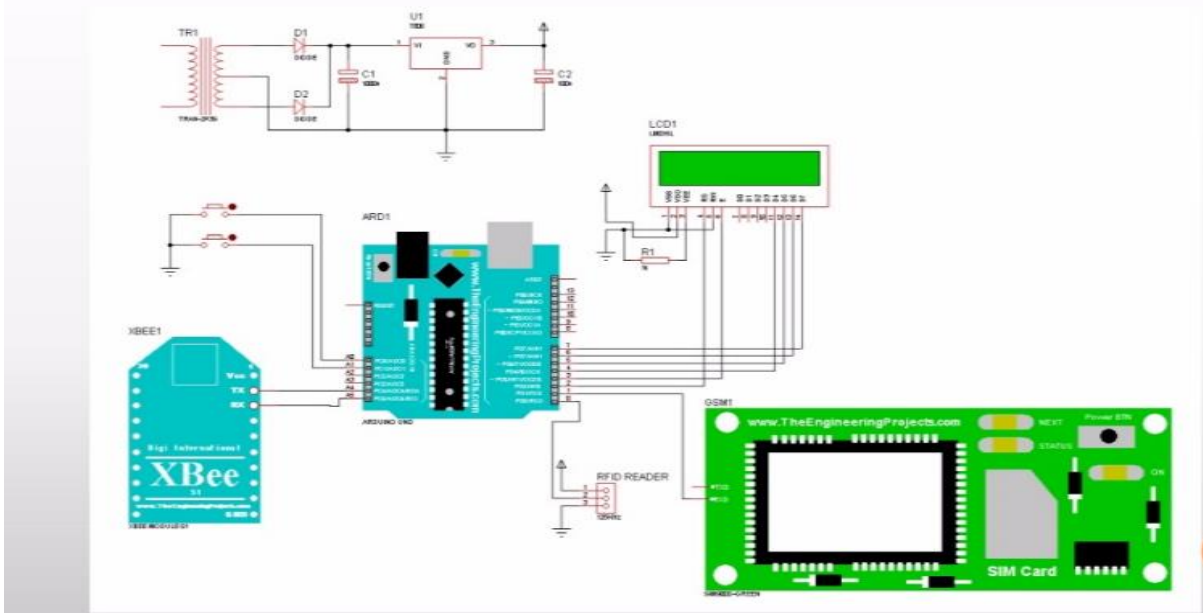
If you wish to press switch 1 then swipe the RFID ATM card then we will get the SMS that money is debited from the account and at the billing section too we can see the status as "bill paid".

If you wish to press switch 2, at the billing area we can see status as "pay the bill", then we have to pay the amount through cash.

Step 6

All the above tasks and functioning of the project can be noticed on the monitor screen.

SCHEMATIC DIAGRAM



(Fig 13 – Schematic Diagram)

ARDUINO UNO SOFTWARE

```
sketch_sep14a | Arduino 1.6.11 (Windows Store 1.6.11.0)
File Edit Sketch Tools Help
sketch_sep14a
void setup() {
  // put your setup code here, to run once:
}
void loop() {
  // put your main code here, to run repeatedly:
}
```


COMMANDS THAT WE USE IN ARDUINO UNO SOFTWARE

Funcios	Syntax	Description
pinMode()	pinMode(pin,mode)	Configures the specified pin to behave either as an input or an output.
digitalRead()	digitalRead(pin)	Reads the value from a specified digital pin, either high or low.
delay()	delay(ms)	Pauses the program for the amount of time(in milli seconds) specified as parameter.(There are 1000 milliseconds in a second)
lcd.begin()	lcd.begin(cols,row)	Initializes the interface to the LCD screen, begin()needs to be called before any other LCD library commands.
Serial.begin()	Serial.begin(9600) (in general)	sets the data rate in bits per second (baud) for serial data transmission.

CHAPTER 5 :- CONCLUSION

Whenever we add a product into the truck, it peruses the item and captures the information. After we have added the item in the cart the customer picks their installment mode and therefore the bill status is refreshed at the server of that specific truck. Clients can pay their bill through RFID ATM card or through cash or credit/charge cards at the billing area as automatically the bill is generated.

Subsequently, by utilizing RFID based smart shopping truck and billing framework the shopping can be made simple for the customers as well concerning the managing staff as it does not need any special training

5.1 FUTURE SCOPE

1. Advancement of projects should be possible in many ways, where RFID labels can be replaced by RFID stickers which are little in size, minimal expense.
2. Security can be enhanced by counting the quantity of items or putting weight sensors inside the truck for counting the weight and getting every one of the kinds of item names when the cart is passed through a specific walkway utilizing a camera module.
3. Numerous RFID labels can be read involving a solitary RFID peruser for additional items which we wish to include the truck.

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