SMART SHOPPING TROLLEY WITH AUTOMATED BILLING

GROUP N0 - MPI_24

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INTRODUCTION

- Nowadays, if a consumer would like to buy something at a shopping mall, consumers need to take the particular items from the display shelf and then queue up and wait for their turn to make payment.

- To try to solve the problems previously identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives to save consumer’s time.

SCOPE OF PROJECT

Smart shopping trolley technique is an appropriate method to be used in places like supermarkets, this will help in reducing manpower and helps in making a better shopping experience for customers.

- This project presents the development of automatic shopping trolley for supermarkets including the weight constraints.

- This project works on Arduino, RFID reader, tag for scanning the products, weight module to verify the weights of products in trolley with the products purchased and LCD to display the billing.

PROBLEM DEFINITION

The current system involves a large amount of manual handling on the part of the customer. It helps in tracking and identification of trolleys, which is useful for the management of the shop but does nothing for the customer.

Proposed Solution

- Master card that enables customer identification and also acts as a rechargeable debit card.
- Using RFID technology for automatic detection of products.
- Adding weight constraints using Load cell and HX711 amplifier to ensure there is no malpractice.

LITERATURE SURVEY

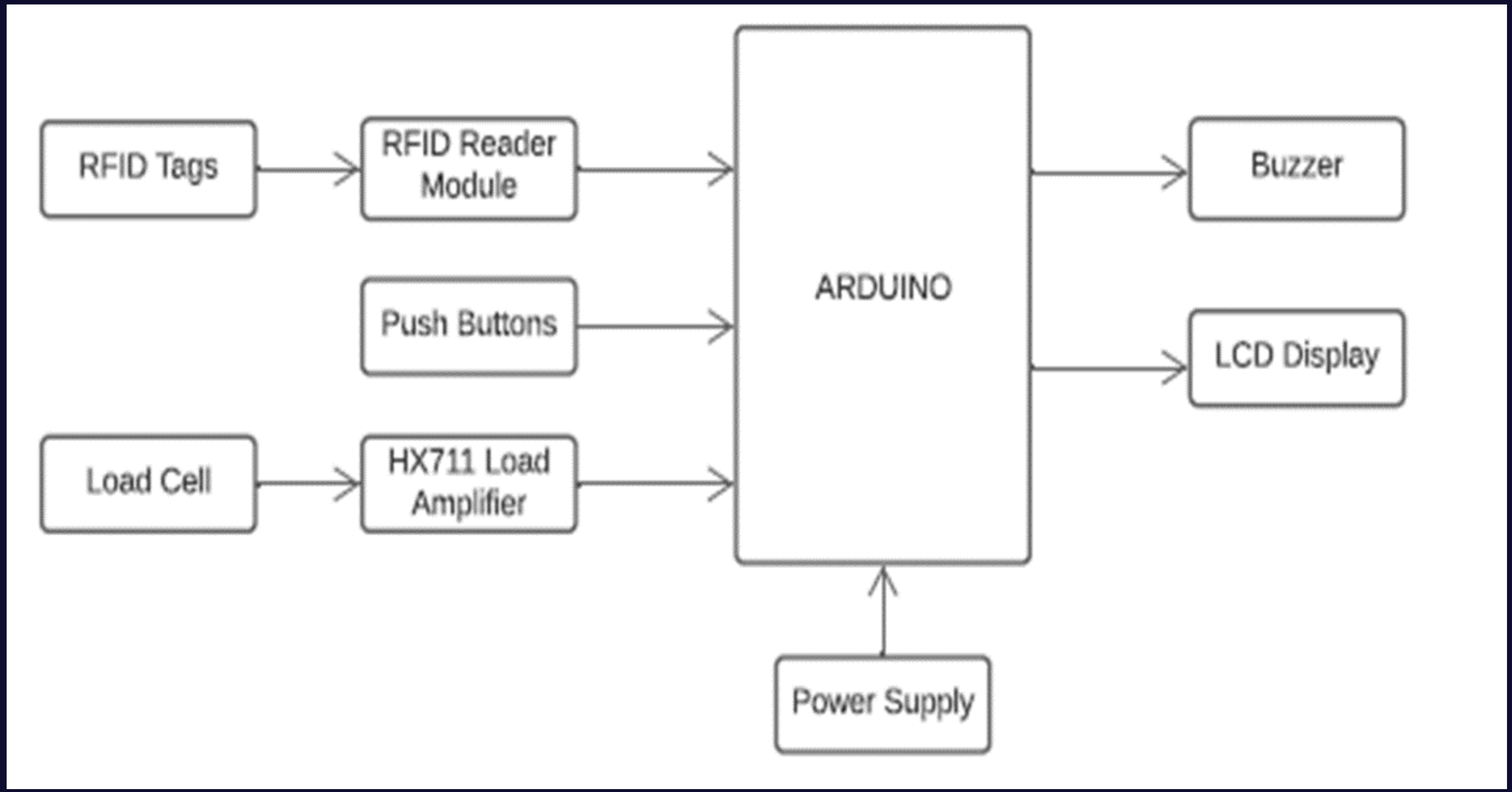
RFID based smart shopping and billing

In [1] this paper explains how to access real time information about the diverse product inside the shopping cart. It included the implementation of smart shelves, which tells when the smart carts enter an aisle and delivered product information to carts.

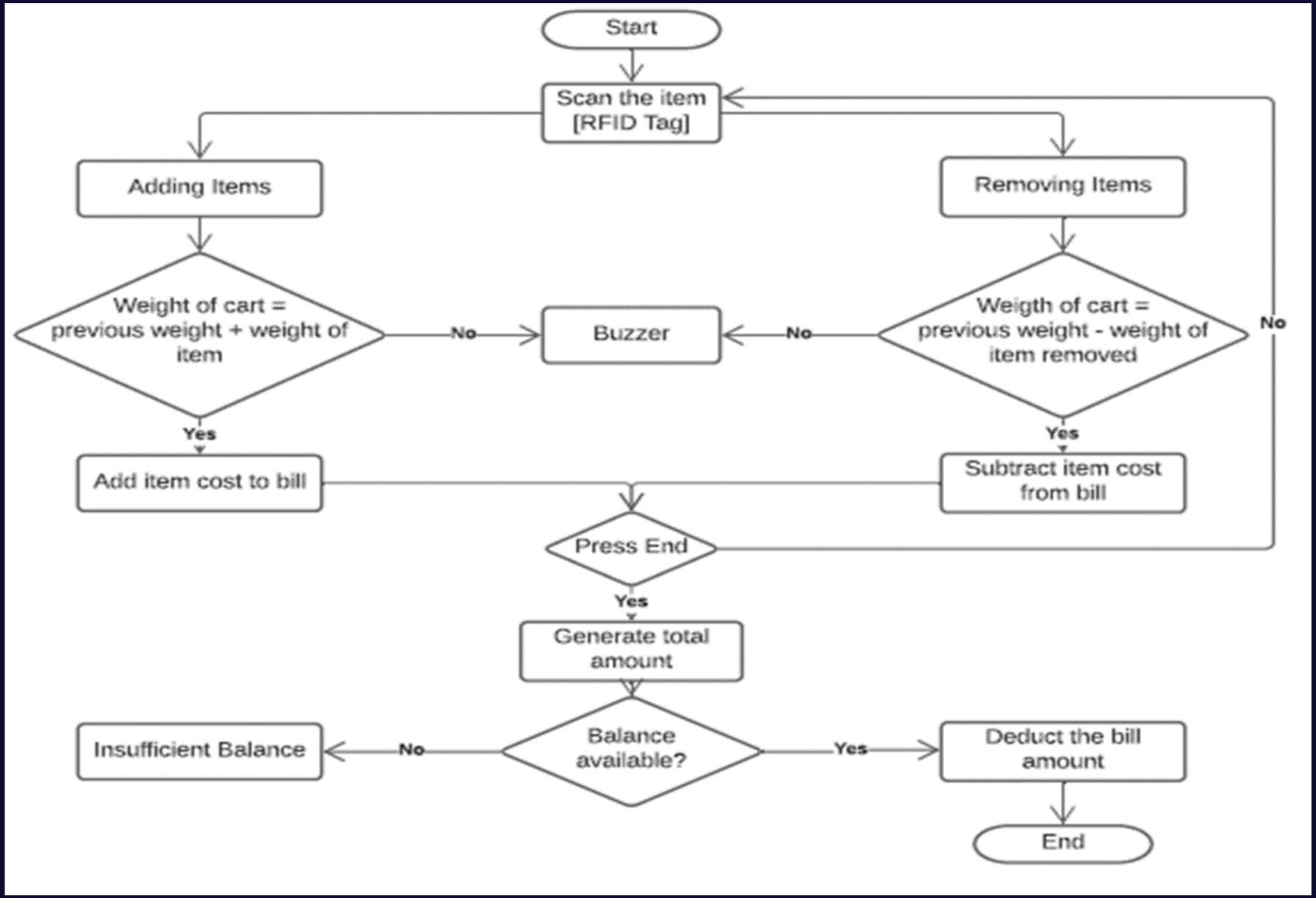
RFID based Smart Shopping: An Overview

In [4] this paper depicts that constant enhancement is required in the traditional billing system so as to improve the quality of shopping. To improve the existing system this shopping cart will generate the shopping bill on cart itself with the help of RFID reader.

BLOCK DIAGRAM



FLOWCHART


Start
Scan the item [RFID Tag]
Adding Items
Removing Items
Weight of cart = previous weight + weight of item
No
Buzzer
No
Weigth of cart = previous weight - weight of item removed
No
Yes
Yes
Add item cost to bill
Subtract item cost from bill
Press End
Yes
Generate total amount
Balance available?
No
Insufficient Balance
Yes
Deduct the bill amount
End

METHODOLOGY

The methodology that we propose is based on the idea of creating an automatic billing system while shopping made possible using RFID assisted by weight module. All the products in the shopping malls or supermarkets are provided a unique RFID tag instead of a barcode.

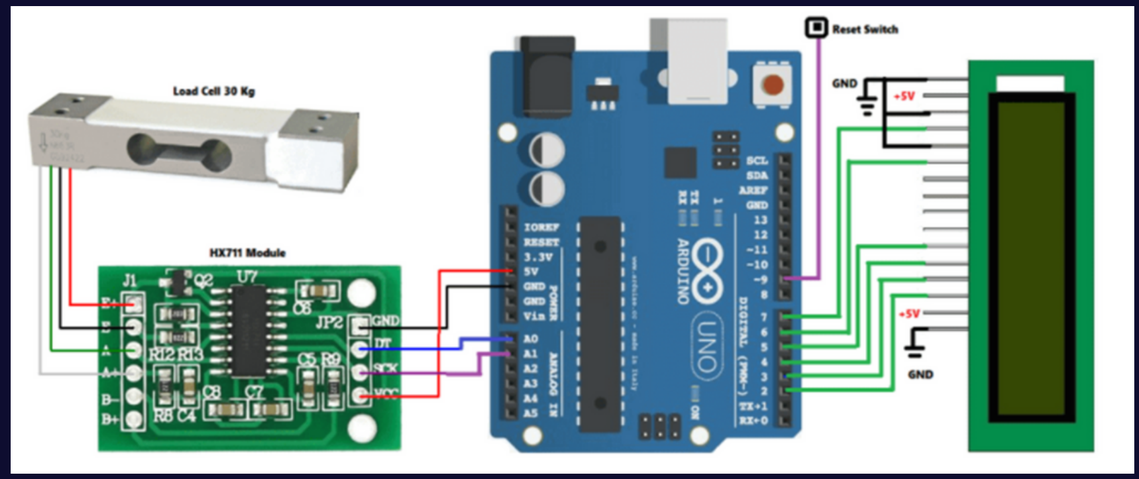
Each shopping trolley has its own setup which contains an RFID reader, a push button to make payments , buzzer to indicate any malpractice and an LCD screen to display all information related to the item.

Components required

1.Arduino UNO
2.RFID reader
3.RFID tags
4.I2C LCD display -16x2
5.Push buttons
6.Buzzer
7.Load cell
8.HX711 amplifier

WEIGHT MODULE

Load cell which is an amplifier senses the weight and supplies an electrical analog voltage to **HX711 Load Amplifier Module**. Then this amplified value is fed to the Arduino where the output of HX711 is converted into the weight values in kilograms.

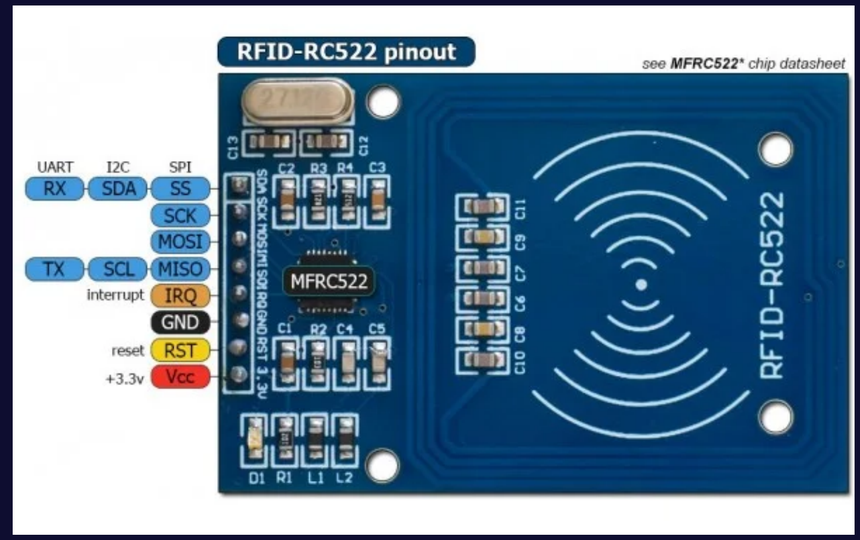


why weight module?

Why not sensors?

RFID MODULE

why not barcode reader?



If RFID, why master card?

BUDGET

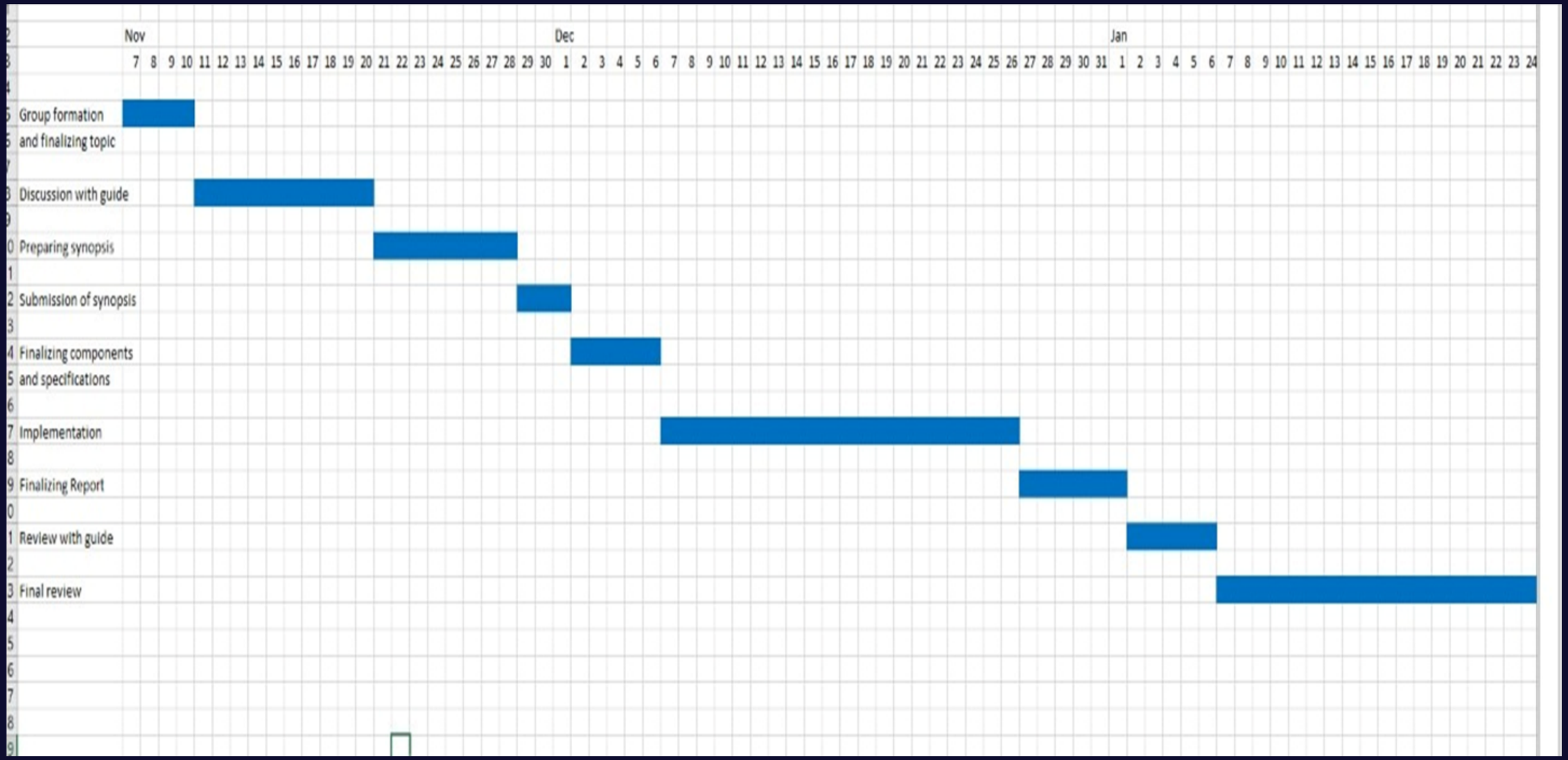
1. Arduino UNO	700
2. RFID reader	250
3. RFID Tags and Master card	100
4. LCD display – 16X2 + I2C Module	270
5. Push buttons	5
6. Buzzer	25
7. Load Cell + HX711 Load Amplifier	400
8. Products	50
TOTAL	1800

CONCLUSION

It can be implemented in shopping malls where there is a large crowd and huge rush into malls.

- In the world of Automation, This automatic billing system plays a major role in the upliftment of technology.
- This technology will replace the present barcode system which is being followed and also more efficient because of the weight module.
- Hence this technology can help people to make their life’s easy and time saving too.

PROJECT PLANNING



FUTURE SCOPE

- Improvement in tag life expectancy and durability.
- The RFID technology brings new opportunities as well as challenges to the AIDC infrastructure.
- RFID brings the best of IoTs to the modern warehouse.
- It is poised for some significant advancements in healthcare, retail, food safety and other markets.
- Weight modules included in shopping carts can detect malpractice and reduce manual handling of checkouts.
- Cameras with image processing techniques can be used for high efficiency.

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[3] “SMART SHOPPING CART USING RFID TECHNOLOGY” International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 2, Issue 12, December 2013

[4] "RFID based Smart Shopping: An Overview" in International Conference on Advances in “Communication and Computing ” Technologies ,Issue in 2014.

[5] "Smart Shopping Cart" in School of Electrical Engineering, VIT University,Vellore IEEE,2017.

[6]" Automated Billing Cart." International Journal of Computer Science Trends and Technology (IJCST) – Volume 5 Issue 2, Mar – Apr 2017

Thank you!