Smart Shopping Trolley

Nikita Khawase Mam

Project by – Kuber Markad , Akarsh Patankar , Harsh Nigudge , Rohan Methekar

Abstract - *On weekends and holidays, we can notice a large rush at shopping centres in metro areas. This is amplified when there are substantial discounts and deals.*

When you only want to buy a few things, it's really inconvenient to have to look through the entire store to find them. We eventually ask the store employees to assist us, but this takes some time because today's stores are extremely large and complex. People nowadays buy a wide range of things and place them in the shopping cart. After making all of one's purchases, one should proceed to the counter for billing purposes. The cashier prepares the bill using a barcode reader, which is a time-consuming operation. As a result, long lines form at the billing counters.

The construction of a system at shopping malls to handle the aforementioned difficulties is proposed in this notion. To do this, every item in the mall should have RFID tags, and all trolleys should have a technology that we invented to speed up the entire shopping process. In addition, as part of this project, we created an Android application. After entering the store, we merely need to pair the Android app with the gadget mounted on the trolley via Bluetooth and begin travelling down the aisle. The device will tell us whenever a product we want to buy that we previously added to the cart of our Android app is present in one of the areas across the aisle. When a product is placed in the trolley, its code is automatically detected, the item name and cost are displayed on the application, and the cost is then added to the overall bill. If we wish to remove a product from the cart, we can do so, and the price of that goods will be deducted from the total.. As a result, billing can be completed while in the trolley, saving time.

Keywords - IoT, RFID, Arduino, Android application, Bluetooth, Smart shopping cart, Sensors.

INTRODUCTION

Since the dawn of time, people have been inventing new ways to meet their needs. The primary driver of innovation is the desire for greater independence, which leads to bettering tasks and making routine ones simpler and faster. Shopping is a crucial task in which people expend the greatest amount of energy. A shopping centre is a location where people go to get their daily requirements, such as food, clothing, and electrical machines. Clients frequently express dissatisfaction with the lack of particular information regarding the marked-down item and the waste of unnecessary time spent at the cash registers In today's innovative world, every grocery store and supermarket employs shopping trolleys to assist customers in making purchases. and storing the things they intend to purchase. Customers normally buy what they need and put it in their carts, then wait at the counters to pay their bills. Payment of bills at the counters is a very inconvenient and time-consuming process, resulting in a large crowd at the counters. Technology has a significant impact on human lives. The evolution of ecommerce has altered our shopping habits and styles over the previous decade. eCommerce and the Internet are inextricably linked. Online shopping has become possible thanks to the Internet, advertising, and marketing. Because of the emergence of specialised sites such as Amazon, Julie Chic, Instagram, and others, internet shopping has spread. However, the existence of e-commerce has not slowed the growth of traditional markets. The market is a real-world location where a seller and a buyer engage in terms of services and product sales., where the emergence of commercial thought contributes to the increase of trade exchanges based on the sale and

purchase. Customers are given shopping carts by stores so that they may easily move their purchases around the store.

This paper focuses on the implementation of a Smart Shopping Trolley, which is useful in supermarkets for resolving customer issues such as waiting in lines for billing and keeping purchases under a pre-determined budget. This activity also makes it easier for the cashier to calculate the overall cost when it comes to billing.

A smart trolley differs from a standard trolley. The typical supermarket trolley is readily accessible and inexpensive. In comparison, the smart trolley is sophisticated, costly, and restricted in quantity due to its high manufacturing cost. The smart trolley is distinguished by its accounting speed as compared to traditional accounting. It also delivers a high-quality service by minimizing the amount of time spent at the cashier's counter and the amount of time spent on accounting. A shopping cart will make it easier for the user to transport larger amounts of supplies with less effort. It also aids disabled persons, as well as men and seniors who can walk but lack the strength to pull carts. The cart has a power source and a wheel drive to make it easier to move the trolley and run the engines.

PURPOSE OF PROJECT

The major purpose of this system is to show how a design and setup of an innovative framework for obtaining items in markets may be demonstrated. This cart looks into new mobile innovations and programmed recognised proof developments (such as RFID) as a way to improve the quality of services supplied by businesses and boost client loyalty, while saving time and money. With this device, a fantastic chance will be created to assist clients by displaying a catalogue of products and their associated pricing. As a result, the inventory management unit benefits from an automatic upgrade with each product transaction. This smart cart has the potential to make clients' shopping more relaxing, pleasant, and systematic while also making store management easier. Furthermore, because it does not require additional staff to serve consumers, store owners can boost their profit margins.

PROBELEM STATEMENT

We'll create a smart shopping basket with an automated billing system that not only shortens the checkout procedure but also makes it very smooth and simple.

Traditional shopping, rather than internet shopping, makes people feel more valuable, entertains them,

allows them to enjoy themselves, and provides them with a high-quality product. Traditional shopping and supermarkets must reinvent themselves in these key scenarios if they are to thrive in the modern day. Markets, also known as retail hubs or shopping malls, are sites where multiple small businesses come together to form a market. Others are more deliberate, utilising specifications that treat your paper as if it were a component of the complete proceedings rather than a stand-alone document. Please don't change any of the existing names.

COMPONENTS REQUIRED

1] Node Mcu

2] EM-18 RFID READER

3] I2C MODULE

4] BUZZER

5] RED & GREEN LED

6] RESISTANCE 220-OHM

7] Alphanumeric LCD-1

PROPOSED METHODOLOGY

RFID (Radio Frequency Identification) :

RFID stands for Radio-frequency identification. It refers to a technology, where digital data is encoded in RFID tags and decoded by an RFID reader using radio waves. RFID is comparable to barcoding in that an RFID reader device decodes data from a tag. RFID technology is utilised in a variety of applications, including inventory management, timekeeping, door locks, and access to restricted locations. The EM18 Reader is a widely used RFID module that reads the ID data stored in RFID tags. When an RFID tag gets within range of an EM18 reading module, it stores a 12-digit unique number that can be decoded. This module has an inbuilt antenna that operates at a frequency of 125 kHz and a 5v DC power supply is required to power it up.
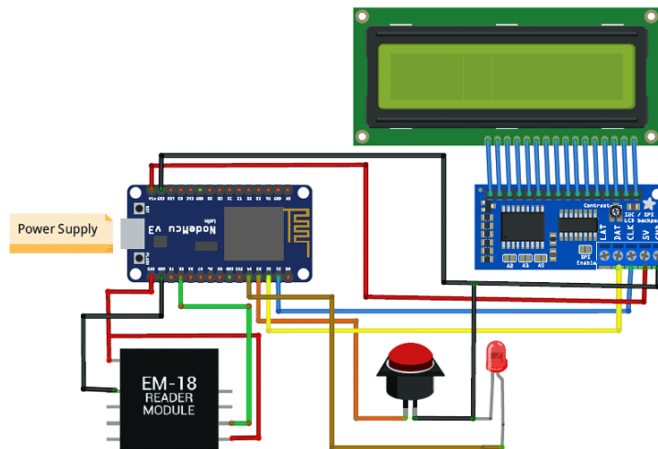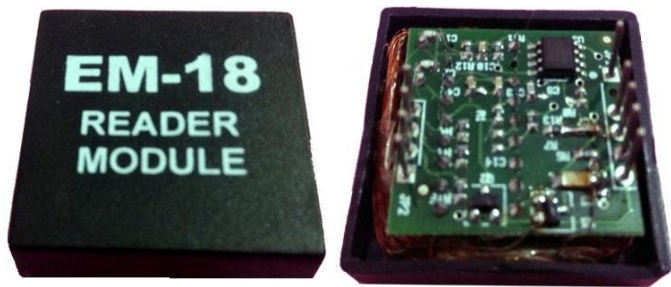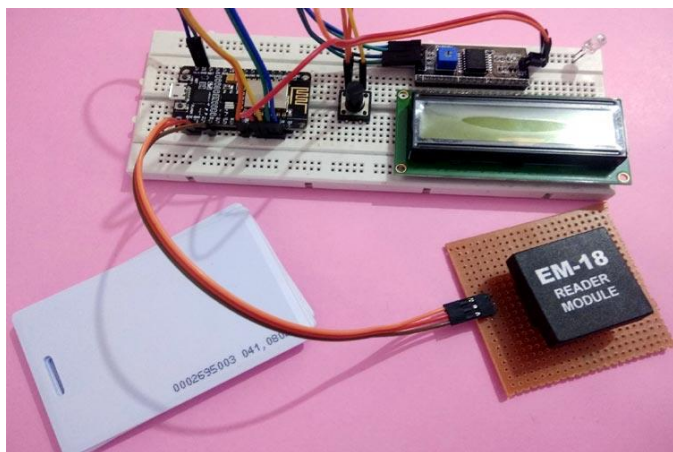
EM18 RFID Reader Features:

- Operating voltage: +4.5V to +5.5V DC
- Current consumption:50mA
- Operating frequency:125KHZ
- Operating temperature: 0-80 degree C
- Communication Baud Rate:9600
- Reading distance: 8-12 cm
- Antenna: Inbuilt
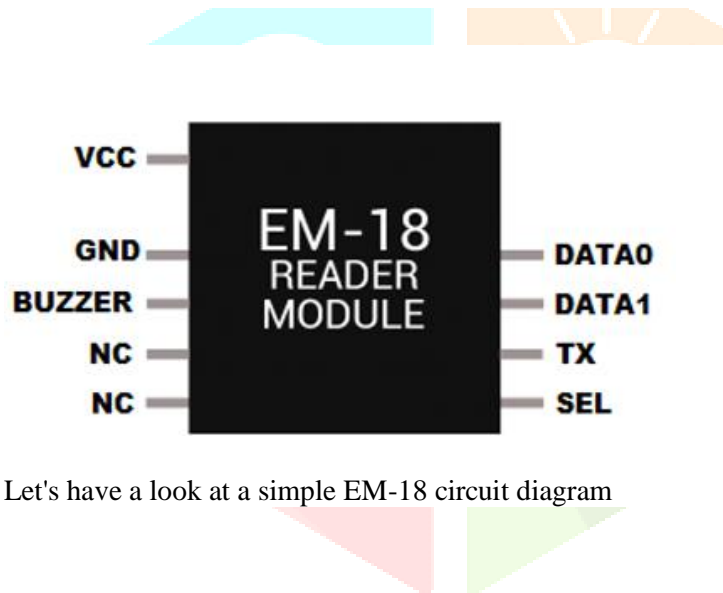
Let's have a look at a simple EM-18 circuit diagram

CONCLUSION

Science and technology advancement is a slow and steady process. The most up-to-date devices and technology are being created. This app is used at shopping centers to help users save time when purchasing goods. RFID is used as a safety access method for the item in this project, which improves surveillance performance. In shopping malls and supermarkets, its implementation will kick off an automated central billing system. Due to the fact that their purchased item information is communicated to the central billing unit, shoppers no longer have to queue near counters for bill payment. The billing procedure becomes considerably faster and simpler as a result of this. In addition to this capabilities, The method ensures that situations of theft caused by fraudulent consumers are recognized, making the system more trustworthy and appealing to both buyers and merchants. The shopping experience will be elevated to a new level as a result of this.

On the LCD mounted to the cart, many factors such as item cost, item name, and so on are continuously shown. As a result, we can predict that automatic product billing using RFID technology will become a more viable option in the coming days, making operations more succinct and methodical.

The goal was accomplished in the prototype model that was produced. The designed product is low-cost, simple-to-use, and requires no special training. The ability to make a decision can be done in the cart itself, which can be used in shopping malls for an easy and creative way of purchasing items to save customers' vitality, time, and money. The project is evaluated using various trial situations, with distinct items being assessed for each of the practical trials. The cart can only transport water

sensitive products because the tags used in this project are water sensitive. Furthermore, because the tags used in this project can only detect one side, they are put in a circular pattern to the products.

FUTURE SCOPE AND LIMITATIONS

Despite the fact that RFID cannot completely replace standardized identifying technology due to higher costs, precision, and speed, RFID implementation is fast. Retailers, manufacturers, and consumer products companies such as CVS, Tesco, Prada, Benetton, Wal-Mart, and Procter & Gamble are currently implementing the idea and assessing its impact on their businesses. RFID can be used by others as well. Understanding innovation and varied components to reduce potential complications is the foundation of success. It is past time for the industry to begin implementing new technology, such as RFID, in a variety of applications, such as fabrication and storage. The number of products in the basket is limited to 50 in this project since the clients do not like having too much luggage at once. The tags used here can only be fastened to the products in a longitudinal form, with no folds. Tags for the reader are 8cm long and 2cm wide, and they must be connected to the products in a visible manner for the reader to detect them. The terms "water sensitive" and "metal" were employed in this project. As a result, the trolley may only use water-sensitive packed and metal-sensitive packaged products. However, the problem can be solved with waterproof and metal-resistant tags, which are currently being researched. And the multiple item RFID scanner utilized here has the limitation of occasionally skipping the tags. According to the requirements, a reader capable of detecting less than 50 tags per second is used, while the cost of the system's development is kept under control.

REFERENCES

[1]   Suraj.S, Vishal Guruprasad, Udayagiri R Pranava, Preetham S Nag,   RFID Based Wireless Intelligent Cart Using ARM7   International Journal of Innovative Research in Science, Engineering and Technology, Vol. 5, Issue 8, 2016.

[2]   KomalAmbekar, Vinayak Dhole, Supriya S harma   Smart Shopping Troll   Using RFID International Journal of Advanced Research in Computer Engineering Volume 4 Issue 10, 2015.

[3]   K.Gogila Devi, T.A.Kaarthik, N.KalaiSelvi, K.Nandhini, S.Priya, "Smart Shopping Trolley Using RFID Based on IoT   International Journal of Innovative Research in Computer.

[4] Gangwal, U., Roy, S., & Bapat, J. (2013). Smart Shopping   Cart for Automated Billing Purpose using Wireless Sensor   Networks. 4(c), 168–172.

[5] Dheple, S., Kumari, D., Jadhav, M., Lihitkar, D., &   Umakanttupe, A. P. (2018). Smart Shopping Cart with   Automatic Billing for Supermarket.

[6]   Pandey, S. S., Gupta, S. R., Shaikh, M. M., Rawat, K. M.,   & Jangid, P. P. (2018). Smart Cart Using Arduino and RFID.