Smart Shopping Cart using RFID

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ABSTRACT

In modern times, when time is crucial in our fast paced lives, it is common to see people getting overwhelmed over spending unnecessary time over long queues in shopping marts. The time spent on the queues are - more often than not -greater than the time spent on actual shopping. In order to curb this problem in addition to a few others, we are proposing a Smart Shopping Cart which uses the RFID technology to identify the products details and sends the data wirelessly to the central billing system. In traditional billing systems after total purchasing, one should approach counter for billing purpose. All products in the mall should be equipped with RFID tags and all trolleys should be equipped with a RFID reader and LCD screen.

Keywords: RFID reader, RFID scanner, LCD Display, Raspberry Pi3, Smart Cart

I. INTRODUCTION

The Smart Shopping Cart project will help in reduction of manual detection and billing of the total items. The main aim of the project is to make a user friendly and hassle free shopping experience to the customers as well as reduce the time consuming billing process at the billing counters. Each cart will be equipped with a Raspberry Pi, a RFID reader, LCD screen and battery. The products to be sold will have RFID tags attached to them for identification. The items will be detected as and when they are placed in the Smart Cart, and thereby the total bill is displayed on the LCD screen. This will reduce the instances of the budget issues of customers that frequently occur at billing counters of shopping marts. The customers can remove or add the products according to their budget preferences and only the final bill will be paid at the billing counter without them needing to manually prepare the bill.

II. Existing system

In current shopping approaches, after the entire purchase has been made, we move ahead to the billing counter to get our bill of our purchased products. The staff present at the counter scans each product individually using a barcode scanner which might take a lot of time. Very often the customers have to wait in long queues to get their bill generated. Furthermore, waiting in-queues may cause misunderstandings or conflict amongst people, for instance,

when someone breaks the line and stands in front of other people. Once the customer reaches the cashier he/she might face the problem of inadequate money available at time moment and may have to remove certain products from the bill and face embarrassments.

III. Proposed system

This proposed system starts working from the first step. When a customer enters into the mall he/she first takes a cart. Every cart is connected with a RFID reader, a Raspberry pi and LCD screen. When the customer starts dropping products into the cart, tags will be read by the reader and the reader sends the information to the Raspberry pi. The Raspberry pi compares the information with the data already stored in the database. If the data matches then the cost of that product will be displayed on the LCD screen for user. If the customer wishes to remove any product from the cart then they can remove the product from the cart and cost of that particular product will be deducted from the total amount and after shopping the products data with total amount gets transmitted to the central billing system .The RFID Reader will be placed in the mid position on the base/bottom inside the trolley. The cart is designed in such away that the outer part of the cart will be covered with RF(Radiofrequency) shielding in order to make sure that the RFID reader will not read any products associated with tags beyond the cart.

IV. Software used

Tkinter module

The front end used in the project is done using the Tkinter module. Tkinter is a standard Python interface for the Tk GUI toolkit. GUI is nothing but a desktop app that provides with an interface that helps to interact with the computers and enriches the experience of giving a command.

Raspbian

Raspbian is a Debian based computer OS for Raspberry Pi. There are several versions available including Raspbian NOOBS and Raspbian Stretch. In this project we are going to be using Raspbian Buster since it is a bit better than the basic NOOB version. It uses PIXEL, Pi Improved X-window Environment, Lightweight as its main desktop environment.

Python

The programming language used for interfacing Raspberry Pi with the LCD and RFID reader/writer is python. Python is an interpreted, high level programming language

MySQL

The database of the project is done using MySQL which is one of the best RDBMS being used for developing various web based software application. It delivers a very fast, multi-threaded, multi-user, and robust SQL database server.

V. System Description

Flowchart

The system detects the RFID tags. Once the tag is detected, the algorithm checks if the code matches with the code in the database and displays the data associated with it. If the tag does not match anything it shows "Not in Database". And continues to check for other tags in a recursive manner.
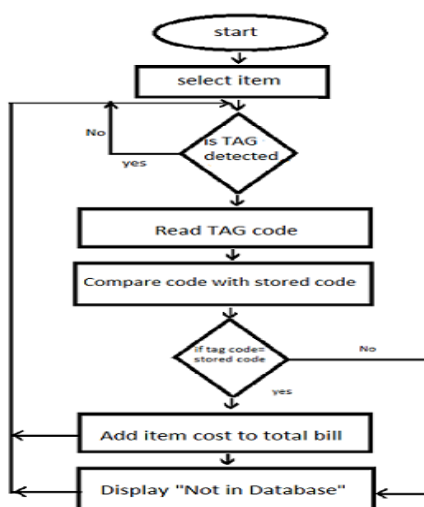

Fig. 1 : Algorithm Flow Chart

VI. Acknowledgment

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