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Smart Shopping Trolley Using Raspberry Pi Kit - Automatic Billing System via IOT

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ABSTRACT: Now a days, Shopping have become daily activity in cities. People buys product from shopping mall for their regular use. To get their products scanned using barcode scanner and to get it billed, the customers have to stay in long queues. In this project, we are developing the trolley where the customer has to scan product barcode which they wish to purchase. The scanned product is dropped into the shopping cart of customer and then the customer can make payment online or at the Billing Counter. We have proposed a technique which means to decrease and perhaps wipe out the aggregate holding up time of client, bring down the aggregate labor prerequisite from charging counter and increment effectiveness by and large.

KEYWORDS: Billing System, Raspberry Pi 3, IOT, Smart trolley, Barcode Identification

I. INTRODUCTION

Humans want to decrease the tasks using the technology in a easier way. A main thing where the humans spend maximum time is shopping. All the supermarkets and malls will have a shopping trolley and baskets for the customers to purchase the products. Time is most valuable in every one's life, no one wants to waste their time. But while shopping everyone waste most of the time at the billing counters by standing in queue. If it is a festival season, the crowd is usually high and billing time will increase promotionally. Shopping needs more time which includes the long queue. Smart Trolley is also known as "*Electronic Shopping Trolley*". It is used in various application Oriented fields to make a Bill/Payment for purchased Grocery, Medicines, Supermarket items, etc. It will reduce the Manpower in Billing section. Most consumers will worry the amount of money brought is not enough to pay for all the things that wanted to be bought until it comes to our turn to pay at the cashier. If the technology of RFID is implemented. Consumers will be able to get information of all the items at shopping mall, total up the prices of items as they shop, and save unnecessary time which is wasted unnecessary at the cashier.

Paper is organized as follows. Section II describes automatic billing and detection scheme, connected component analysis and set of selection or rejection criteria. The flow diagram represents the process of the algorithm. After scanning process, how billing region is filled using a Software technique that is given in Section III. Section IV presents experimental results showing results of images. Finally, Section V presents conclusion.

II. RELATED WORK

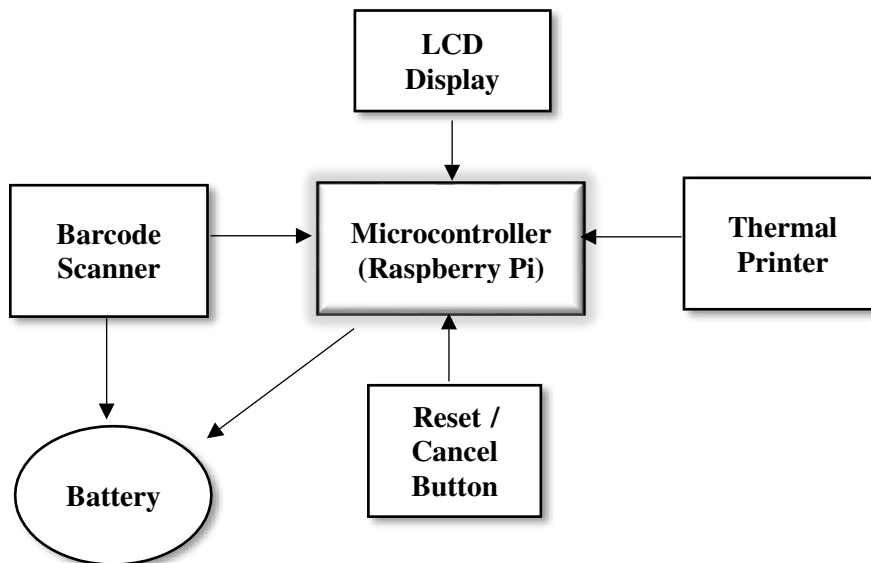
The Paper that had proposed that Automatic Billing System using Li-Fi Module will be the effective way to reduce the human effort. Li-Fi is cellular wireless networking (re)using lights. Specifically, light emitting diodes (LEDs) are used in Li-Fi as visible light transmitters and its very costly. Another Paper proposed that automated billing system using RFID and ZigBee communication [1]. Here, each product of shopping mall, super markets will be provided with a RFID tag, to identify its type. Each shopping cart is designed or implemented with a Product Identification Device (PID) that contains microcontroller, LCD, an RFID reader, EEPROM, and ZigBee module [2]. Automatic Toll Gate System Using Advanced RFID [3] and GSM Technology [4]. In that, the frame composing and working flow of the system is described and data information is also easily exchanged between the motorists and toll authorities, thereby enabling a more efficient toll collection by reducing traffic and eliminating possible human errors. [5] Here the



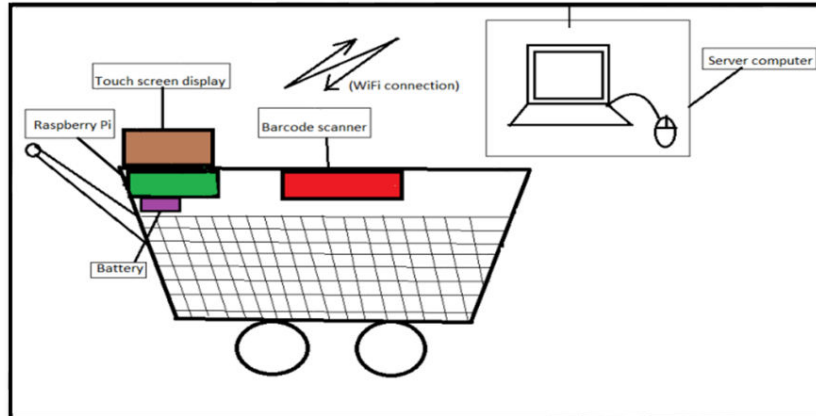
vehicle information is got through the RFID whereas we use RFID for the scanning of products. [6] Automatic Power meter reading using GSM network. In that, GSM Power Digital Meter (GPM) is installed in every consumer unit and an electricity billing system at the energy provider side. The web portal is used in the power meter reading wherein we use a mobile application for the trolley. The work in this paper is divided in three stages. 1) Automation 2) Scanning 3) Billing - these are the following process in this billing System.

III. METHODOLOGY

Raspberry pi is a microcontroller that is used in this project and it acts as a controlling device in this project RFID is interfaced with raspberry pi for billing purposes through python that related to the installation of openCV (open-source computer vision library) to get the product information. the TFT or alphanumeric lcd display is interfaced with raspberry pi which is used for displaying purposes. the thermal printer is interfaced with the raspberry pi 3 to print the bill for the purchased items. our project is based on the smart trolley is a shopping assistant who supports customers for displaying more product information, accommodating with personal wheelie trollies/trays. smart trollies and smart checkout systems have been redefining customer experience in retail stores in recent years by automating the checkout process. it is based on the using raspberry pi 3 and barcode scanner using pos (point of sale) billing system. and it have a TFT-LCD screen to display a QR code for the online UPI payment to avoid the cash problems.



Raspberry Pi is a low-cost, basic computer that was originally intended to help spur interest in computing The Raspberry Pi computer is essentially a wireless Internet capable system-on-a-chip (SoC) with 1 GB RAM, connection ports, a Micro SD card slot, camera and display interfaces and an audio/video jack. The RaspberryPi is a credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python.

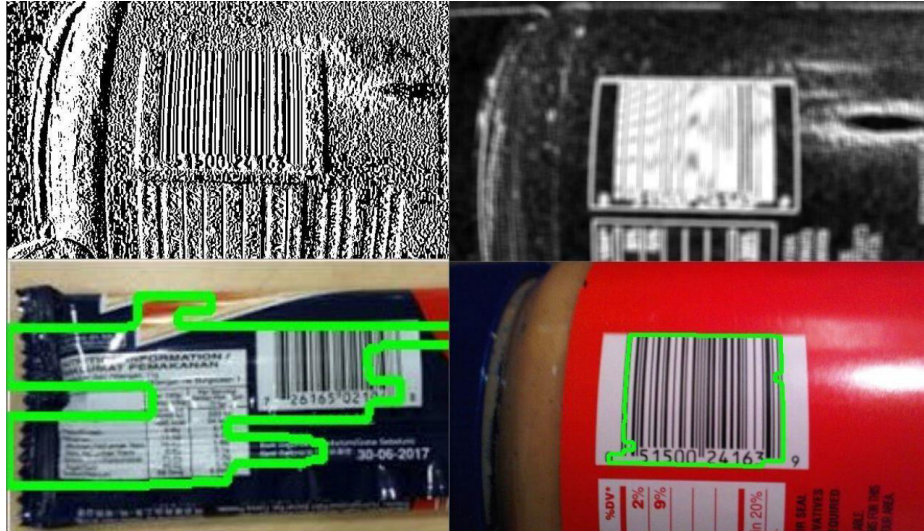


IV. EXPERIMENTAL RESULTS

In this project we are going to build a Smart Shopping cart by interfacing a thermal receipt printer, LCD, and a USB barcode scanner with Raspberry Pi. This Smart Shopping cart will scan an item's Barcode, display its information on 20x4 LCD, create the invoice, and print it using a Point of Sale (POS) Thermal Printer. We will be using a Google spreadsheet to retrieve the data associated with the respective scanned barcode, like item Name, Price, etc. Also, we will create an online database using Google Spreadsheet where the information of all the items is already stored. You should check out our Reference Articles related to this project, if you want to know the interfacing of Raspberry Pi and Barcode Scanner with Thermal Printer and LCD. The model consists of IOT as hardware and python 3.11.2 as software coding. The project datasets consist of a product detail such as product name, product weight, cost and ID of the product which is stored in raspberry Pi database. This information can be used later for fetching details of the product from the database corresponding to the barcode. The project uses ZBar algorithm to encode and decode the barcode. ZBar is an open-source software which helps to read barcodes from various sources like video streaming, image files and raw intensity sensors. Attributes of ZBar are high speed, small memory and unlimited images. The Pi camera uses an OS called OpenCV. Open CV is a cross platform library which used to develop real time computer vision application and it is used in image capturing.

The steps are as follows:

- a. Initialize the system i.e., power up raspberry pi, LCD.
- b. To add a product into the trolley, switch on the add button.
- c. Scan each product and add it to the trolley, the corresponding product name, price, weight and Id will be displayed on the LCD.
- d. Once all the products are scanned switch off the RESET button.
- e. If any of the products need to be removed, switch on the delete button and scan the product to be removed and then switch off the delete button



V. CONCLUSION

We have implemented the Smart Billing System across the multi-purpose it will be more useful in the shopping field. Our paper will be more helpful in the field of IOT and Electronics. These are the above-mentioned processes able to build the smart trolley. Billing will be handled by all kinds of people whether they are educated persons or uneducated persons all of us can be easily accessible. The Shop owner used to buy this project it will regret the high paid workers instead of that high salary expectation and time to make the bill for a long hour. It will able to save the time and to avoid billing queues This project may be got successful or not sure it will help all the people to save the time in unnecessary activities.

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