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Smart Trolley with Advance Billing System

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ABSTRACT

The shopping centre is a spot where individuals get their regular necessities. In shopping malls, there has been an emerging market for fast and simple payment of bills. Very sometimes, shoppers are dissatisfied with finding the items on the shopping list while shopping in a store and no help is required. We have developed a smart trolley with a smartphone app to solve these issues. This paper offers an interface to help consumers locate the product's location. It also offers a consolidated and automatic billing system using NodeMCU's barcode scanner. Super markets will be issued with a barcode for each shopping mall commodity, to distinguish its type. A Product Identification System (PID) containing NodeMCU, the barcode reader, is used for each shopping cart. Purchasing product details on the shopping cart can be read by a barcode reader and presented in the mobile app that is linked to the device. The complete bill is passed to the PC by the processor at the billing counter.

Keywords : billing trolley, barcode, nodeMCU, shopping.

I. INTRODUCTION

Since the dawn of civilization, people have continually produced creativity to support their demands. More independence can be the underlying explanation for success of creativity and this contributes to developing assignments and making them smaller and easier on a daily basis. Shopping is one crucial activity for individuals to expend the highest measure of energy. The shopping centre is a place where people get their everyday needs from food supplies, clothes, electrical equipment and so on. Most of the time clients have difficulties with the unspecific details concerning the object marked down and the abuse of the counters' superfluous time. Each grocery store and supermarket in this revolutionary world utilises shopping trolleys with a particular end purpose to help consumers pick and store the things they expect to purchase. Customers normally buy the necessary goods and put them in their carts and wait for bill payments at the counters thereafter. The paying of bills at the counters is a very troublesome and time-consuming procedure that raises the number of people at the counters. As demonstrated by a survey undertaken by the US Department Corporation, individuals regularly spend 1.4 hours

shopping on a daily basis.If the queue is too long, a large amount of customers would choose to leave the line. Two classifications (1) Shopping in-individual (2) Shopping in absentia can basically be defined as the new shopping environment. Shopping in absentia is maintained from multiple backgrounds, like web shopping, internet shopping, and so on, which would not entail physical keeping of the buyer at the counters. In-person buying requires an individual call at the place of purchasing and selecting products in view of various variables, including need, convenience, brand, and so on. The suggested keen shopping basket structure plans to assist person shopping to reduce the time spent shopping.In the normal time spent at the registers, continuous improvement is needed to boost the nature of the customers buying history. We also composed a shopping basket to solve these problems expressed above and to improve the present structure. This can be achieved by essentially adding barcode labels to the items in the shopping cart and the reader. Customers will provide details from this system relating to the cost of and thing that is within the cart and even the absolute cost of the item. With regards to the expense of the object, this structure would save time for shoppers and labour needed in the shopping centre.

A. Problem Statement

Realistically, markets are used by a large number of people these days to secure most products. The purchase of goods relates to an uncertain process requiring time spent on passageways, items and checkout lines. Consumers typically face some challenges and difficulties when shopping. Such issues entail stressing that the money they carried would be inadequate for all bought products and dissipating a lot of time at the cashier as well. And also because of the impact of disagreement and also because of lack of equipment that isolates application designs, it is becoming an increasing challenge for the merchants to keep their shoppers consigned and to foresee 3 of their demands.In some cases, consumers have concerns with the insufficient knowledge about the discount item and hence the misuse of superfluous time at the counters in some cases. With the barcode tag, we can end this problem. We present the systematic definition of barcode based keen shopping cart in the field of retail stock to address the current problems.

B. Objective:

The primary aim of this initiative is to introduce a smart shopping cart to improvise ordering with the aid of barcode technology. In the buying cart, the aim is to use the barcode-related monitoring deployment practise. The barcode is used in this plan to secure the purchase of commodities in shopping malls. If the product has been put in the shopping cart, the price of the product shows and the total amount is displayed accordingly, then if we want to delete the product from the trolley, the product will be taken away and the value of the particular product is deducted from the total amount.In this the equipment used is to purchase the goods, thereby increasing the efficiency and speed of protection when buying in shopping complexes. The technical goal of our presented issue in shopping complexes is the practise of barcode technology for the instinctive identification of goods within the shopping cart, thereby annihilating the shopper engaged in the buying and payment task of commodities. The key point of the suggested system is to include an invention that is minimally effort-oriented, easily adaptable, and efficiently viable to facilitate individual shopping. A lot of time can be saved at the billing counters with the help of this .

II. LITRATURE SURVEY

A shopping market is a place where customers come to purchase their daily using products and pay for that. Hence, we are proposing to develop a smart electronic trolley for shopping malls that keeps the

track of purchased products and also helps the customer to pay the bill with the help of swiping machine provided in a trolley. So that the customer can save the time [1].

Here, we are using wireless sensor networks such as GSM to send the information read by the barcode reader to the main server of the shop and to the customers mobile[2]. Microcontroller based design has acquired the status of most happening field in electronics. This is specialized field that has power of integrating thousands of transistors on a single silicon chip. At billing counter customer has to pay and collect the bill. This smart eletronic trolley contains a barcode scanner and also a swiping machine on it, so that there is no need to go to the billing counter and pay the bill, instead customer can pay the bill by swiping his card. The total bill will be sent to the customers mobile, so that paper usage for billing can be reduced[3]. The developed system consists of three components (a) server communication component which contains connection with the cart and the main server, (b) user interface and display component, (c) automatic billing component[4]. The Smart Shopping Cart with Automated Billing System via RFID and Bluetooth was suggested. A Product Identification Package (PID) containing the Bluetooth module, EEPROM, RFID scanner, LCD and microcontroller [5] is inserted in each shopping basket within this system. Gangwal Udita et.al. Proposed Wireless Sensor Networks Smart Shopping Cart for Automatic Billing Purpose They portray the use of a secure, reasonable and cost-productive smart shopping cart using remote sensor networks in this article. For shops, such a system is ideal where it can support in-store laboratories and customers[6]. SudhirRupanagudi Rao et.al. A Novel Cost-Effective Savvy Trolley System based on Video Processing was proposed for supermarkets using FPGA. This depicts a new realistic technique to defeat the dilemma of being unable to find objects by attaching a web camera to the trolley[7]. A. Using GSM and adhoc wireless routing, Vijayaraj and R.Saravanan suggested Automatic EB Billing System Using GSM and adhoc wireless routing, they propose a mechanism in which power charging turns out to be entirely robotized and communication is conceivable through remote systems[8]. Suganya.R, and.al.Automated Smart Trolley using Arduino and Smart Billing. This device is based on RFID and Bluetooth [9] identification.

Radio-Frequency Identification, as stated in[10].

III. BLOCK DIAGRAM

A. Barcode reader:

The barcode reader (or barcode scanner) is an optical scanner which is capable of reading printed barcodes, interpreting barcode data, and transmitting data to a device. It consists of a light source, a lens and a light sensor, like a flatbed scanner, which converts optical impulses into electrical signals. In addition, almost all barcode readers provide decoder circuits that can interpret the image data given by the sensor in the barcode and transfer the content of the barcode to the output port of the scanner.

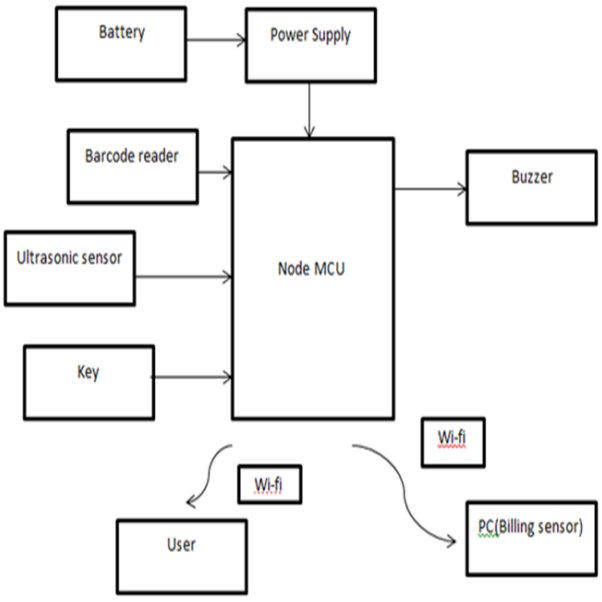


Fig.no.1.Block diagram of design system

B. NodeMCU:

The production board for the NodeMCU ESP8266 comes with an ESP-12E package with an ESP8266 chip and a TensilicaXtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and runs with a clock frequency adjustable from 80MHz to 160 MHz. For data and applications, NodeMCU has 128 KB of RAM and 4 MB of Flash memory. It is suitable for IoT ventures due to its high computing capacity and in-built Wi-Fi / Bluetooth and Deep Sleep Operating functions. The Micro USB jack and VIN pin (External Supply Pin) can be used to power the NodeMCU. It supports the interface between UART, SPI, and I2C.

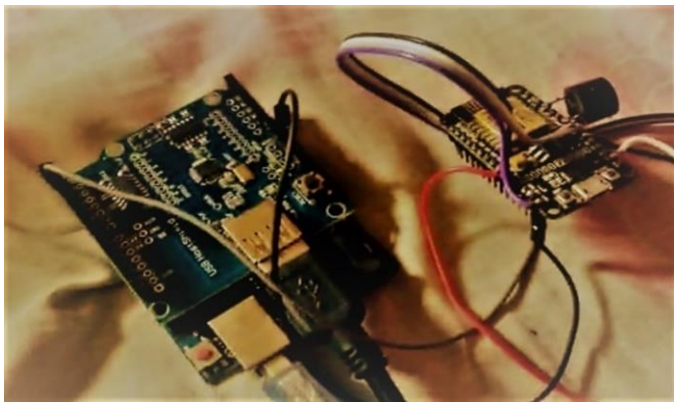


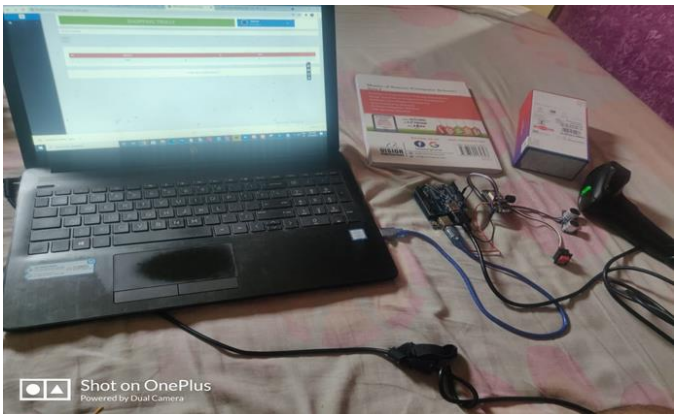
Fig.no.2. NodeMCU ESP8266

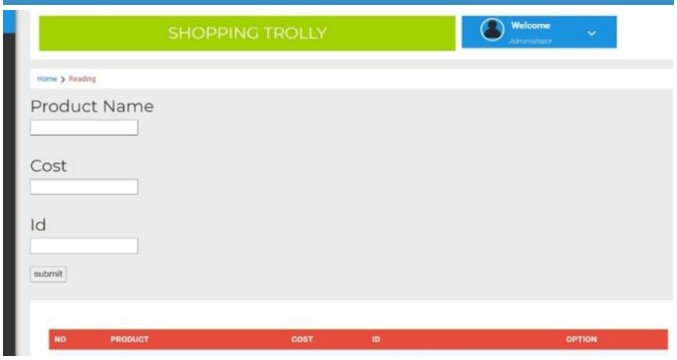
C. 12v Battery:

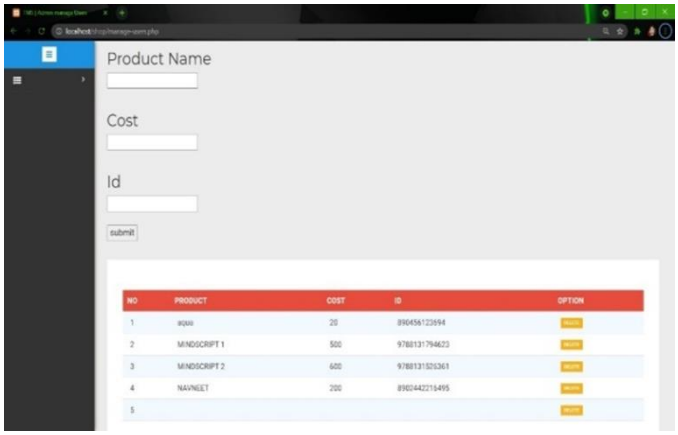
Choose one that suits the criteria until you have measured the total current (I). For eg, for the 600mA power supply, a 1Amp one. Now for our power transformer T, the rms secondary voltage (primary is whatever is compatible with your area) must be our desired output Vo PLUS, the voltage drops through diodes (two diodes). Vo1 must be adequate to provide the LM7805's minimum operating input requirements at all times (min 7.3v to max 25v). assume it has a central tap for a 24vac secondary output like the O.P.'s one (12vac from each terminal to the central tap, 24vac via terminals), so here the secondary output is taken from the central tap to one of the terminals. If it doesn't have a central tap and all you have is 24vac performance, due to the high Vp for this particular situation, it is advised to choose a different one.

Fig.no.3. 12V Li-ion Battery

1. Outcomes and Screen Shots







IV. CONCLUSION

In the built prototype model, the desired goals were successfully achieved. The product produced is convenient to use and economical. While the project shows the proof of principle, to make the smart shopping cart more stable, there are a few things that should be added. To begin with the latency of wireless communication with the server will need to be taken into account in this project.Secondly, it is not really safe to communicate. Sticking the barcode sticker on certain items is difficult. Conventional barcode scanning is more advanced in such situations. In comparison, a more advanced micro-controller and a larger display system can be used to offer a greater interface for users.

V. FUTURE WORK

In the future we can use with the help of an optical sensor, motors, motor drivers, we will make trolleys in such a way that it will follow the customer which purchasing items and it maintains the safe distance between the Customer and itself.

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