

Smart Trolley with Automated Billing

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Abstract: The Shopping Centre is a place where people go to purchase their daily goods. There has been a growing market for quick and easy bill paying in shopping malls. Shoppers are occasionally disappointed with their ability to locate products on their shopping list while shopping in a store, and no assistance is required. To address these challenges, we created a smart trolley with a smartphone app. This paper provides a user interface to assist customers in locating the product. Using Node MCU's barcode scanner, it also provides a centralized and automatic billing system. Each shopping center merchandise will be labelled with a barcode to differentiate it from the others. For each shopping cart, a Product Identification System (PID) with Node MCU, the barcode reader, is employed.

Keywords: billing trolley, barcode, nodeMCU, shopping.

01.INTRODUCTION

People have been producing innovation to meet their needs since the birth of civilization. We face this complexity on a daily basis. Shopping is one of the most important activities for people who want to burn the most calories. The shopping mall is a place where people go to purchase their daily necessities, such as food, clothing, and electrical equipment. Majority of the time, clients have issues with the lack of detailed details about the marked-down item and the abuse of the counters' idle time. In this innovative future, shopping trolleys are used in every grocery store and supermarket to assist customers in selecting and storing the items they intend to buy. Customers often purchase the essential things, place them in their trolleys, and then wait to pay their bills at the counters. Paying bills at the counter is a time-consuming and inconvenient process that increases the number of individuals at the counter. According to a poll conducted by the US Department Corporation, people spend an average of 1.4 hours a day shopping. A big number of consumers will choose to leave the line if it is too long. There are two types of classifications. (1) Individual shopping (2) The new shopping environment can be defined as shopping in absentia. Shopping in the absence is possible through a variety of methods, including web shopping, internet shopping, and other methods that do not require the customer to be physically present at the counters. In-person shopping necessitates a personal call to the store and the selection of products based on a variety of factors such as need, convenience, brand, and so on. The recommended smart shopping basket structure aims to make it easier for people to shop by reducing the amount of time they spend doing it. Continuous improvement is required in the normal time spent at the

registers to improve the nature of the customers' purchasing history. We have created a shopping basket to address the issues and improve the current structure. This is accomplished by affixing barcode labels to the products in the shopping cart as well as the reader. Customers will send information to this system about the cost of each item in their cart, including the total cost of the item. In terms of the object's cost, this construction would save shoppers time and reduce the amount of labour required in the shopping centre.

Problem Statement

In reality, markets are used by a large number of people these days to secure the majority of products. The purchase of goods is an uncertain process that necessitates time spent on passageways, items, and checkout lines. When it comes to shopping, most people face some challenges and difficulties. Such issues include worrying that the money they had with them would be insufficient for all of the purchases they made, as well as wasting a lot of time at the cashier. And, as a result of the impact of disagreement, as well as a lack of equipment that isolates application designs, merchants are finding it increasingly difficult to keep their customers consigned and to anticipate three of their demands. In some cases, consumers are concerned about a lack of knowledge about the discounted item, resulting in the waste of unnecessary time at the counters. We can solve this problem with the barcode tag. To address current issues, we present a systematic definition of a barcode-based keen shopping cart in the field of retail stock.

Objective:

The primary goal of this initiative is to introduce a smart shopping cart that uses barcode technology to improve ordering. The goal of the purchasing cart is to use barcode-related information monitoring deployment practice. In this scheme, the barcode is used to secure the purchase of commodities in shopping malls. If the product is added to the shopping cart, the price of the product is displayed, and the total amount is displayed; if we want to remove the product from the trolley, the product is removed, and the value of the particular product is deducted from the total amount. The equipment used in this is to purchase the goods, increasing the efficiency and speed of protection when shopping in shopping malls. The technical goal of our presented issue in shopping malls is the use of barcode technology for instinctive identification of goods within the shopping cart, thereby eliminating the shopper engaged in the purchasing process. The key point of the proposed system is to include an invention that requires little effort, is easily adaptable, and is economically viable to facilitate individual shopping. With this, you can save a lot of time at the billing counters.

02. LITRATURE SURVEY

A shopping market is a place where customers can go to buy and pay for their daily necessities. So there is a need to calculate how many products were sold and generate a bill for the customer. When we go shopping, we have to work for selecting the right product. Also, standing in line to bill all of the goods is exhausting after that. As a result, we propose developing a smart electronic trolley for shopping malls that keeps track of purchased products and also assists customers in paying their bills using a swiping machine provided in the trolley. so that the customer can save time [1] With the growing use of wide-area wireless sensor networks in consumer applications, it is critical to address the issues raised by their use, such as reliability, energy consumption, and cost-effectiveness. They described the development of a dependable, fair, and cost-effective smart shopping cart using wireless sensor networks, which is suitable for supermarkets looking to reduce labour costs. In this case, we are using wireless sensor networks such as GSM to send the information read by the barcode reader to the shop's main server and to the customers' mobile phones [2]. Microcontroller-based design has become the most popular field in electronics. This is a specialised field with the capability of integrating thousands of transistors on a single silicon chip. They proposed a trolley with a barcode scanner that is powered by a microcontroller. The customer must hold the product

wrapper up to the barcode scanner. The corresponding data will be shown on the screen. The customer must pay and collect the bill at the billing counter. This smart electronic trolley includes a barcode scanner as well as a swiping machine, eliminating the need for the customer to go to the billing counter and pay the bill; instead, the customer can pay the bill by swiping his card. The total bill will be sent to the customer's mobile device, reducing the use of paper for billing[3]An intelligent shopping cart was created to aid people in their daily shopping by reducing the amount of time spent on purchases. The developed system is made up of three parts: (a) a server communication component that connects the cart to the main server, (b) a user interface and display component, and (c) an automatic billing component [4]. The smart electronic trolley includes a fully enclosed cart as well as opening and closing systems to reduce product stealing. The shop processor in the shopping mall will no longer have to worry about theft as a result of this. With a wide range of demands from a variety of spaces, the current world has an ever-increasing population. Customers who need to purchase multiple items in shopping malls or grocery stores require a lot of time and patience to negotiate with one another in order to complete their purchases successfully, and we must use our technology wisely to address these issues. There are numerous new upcoming advances in the field of shopping that provide efficient and cost-effective solutions. This chapter discusses a few of the methods that have been proposed so far in genius shopping. Customers who need to purchase multiple items in shopping malls or grocery stores require a lot of time and patience to negotiate with one another in order to successfully complete their purchases, and we must use technology wisely to address these issues. There are numerous new upcoming shopping advances that provide efficient and cost-effective solutions. This chapter discusses a few of the methods proposed thus far in genius shopping. This chapter discusses a few of the methods proposed thus far in genius shopping. Udit Gangwal et al. Proposed Wireless Sensor Networks Smart Shopping Cart for Automatic Billing In this article, they depict the use of a secure, reasonable, and cost-effective smart shopping cart using remote sensor networks. Such a system is ideal for shops because it can support in-store laboratories as well as customers [6].

SudhirRupanagudi Rao et al. proposed a novel cost-effective savvy trolley system for supermarkets based on video processing using FPGA. By attaching a web camera to the trolley, this depicts a new realistic technique for overcoming the dilemma of being unable to find objects [7].

- A. Vijayaraj and R.Saravanan proposed an Automatic EB Billing System based on GSM and adhoc wireless routing. Using GSM and adhoc wireless routing, they propose a mechanism in which power charging is entirely robotized and communication via remote systems is possible [8].
- B. Suganya.R. and others Smart Trolley Automation Using Arduino and Smart Billing RFID and Bluetooth [9] identification are used in this device.

C. According to [10] AboliHanwate and Poonam Thakare (2015), radio-frequency identification (RFID) is a technology that uses radio waves to pass data from an electronic tag, called an RFID tag or mark, attached to an object, through a reader to identify and monitor the object. The RFID Sticker is a type of wireless card that incorporates an embedded chip as well as a loop antenna. The embedded chip in the card represents the 12 digit card number. The RFID reader is a circuit that generates a 125KHz magnetic signal. This magnetic signal is transmitted by the loop antenna associated with this circuit, which is used to read the RFID card number. In this project, the RFID card serves as a security access card.

03. BLOCK DIAGRAM

A. Barcode reader :

A barcode reader (or barcode scanner) is a type of optical scanner that can read printed barcodes, interpret barcode data, and transmit data to a device. Like a flatbed scanner, it consists of a light source, a lens, and a light sensor that converts optical impulses into electrical signals. Furthermore, almost all barcode readers include decoder circuits that can interpret the image data provided by the sensor in the barcode and transfer the content of the barcode to the scanner's output port in this project.

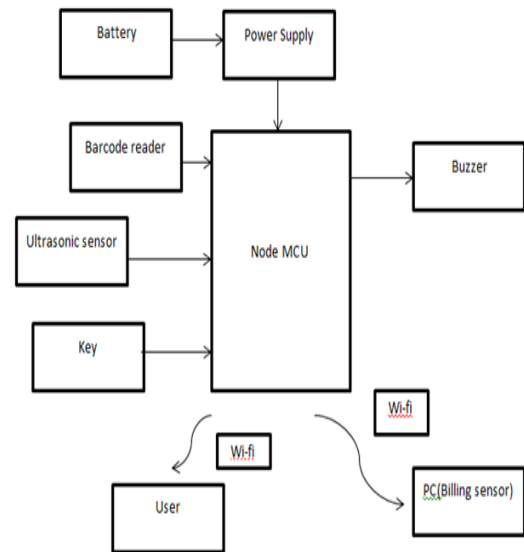


Fig.no.1.Block diagram of design system

B. NodeMCU:

The NodeMCU ESP8266 production board includes an ESP-12E package containing an ESP8266 chip and a Tensilica Xtensa 32-bit LX106 RISC microprocessor. This microprocessor supports RTOS and has a clock frequency range of 80MHz to 160MHz. NodeMCU has 128 KB of RAM and 4 MB of Flash memory for data and applications. Because of its high computing capacity and built-in Wi-Fi / Bluetooth and Deep Sleep Operating functions, it is ideal for IoT ventures.

The NodeMCU can be powered via the Micro USB jack and the VIN pin (External Supply Pin). It supports the UART, SPI, and I2C interfaces.

C. 12v battery:-

Choose one that meets the criteria until the total current is measured (I). For example, a 1Amp power supply for the 600mA power supply. The rms secondary voltage (primary is whatever is compatible with your area) must now be our desired output for our power transformer T. The voltage drops through diodes in Vo PLUS (two diodes). At all times, Vo1 must be sufficient to meet the LM7805's minimum operating input requirements (min 7.3v to max 25v). Assume it has a central tap for a 24 volt secondary output, similar to the one on the O.P. (12 volts from each terminal to the central tap, 24 volts via terminals), so the secondary output is taken from the central tap and routed to one of

the terminals. If it lacks a central tap and all you have is 24vac performance, it is recommended that you choose a different one due to the high Vp for this particular situation.

1 Outcomes and Screen Shots

CONCLUSION

The desired goals were met in the prototype model that was built. The finished product is both user-friendly and cost-effective. While the project demonstrates the proof of concept, there are a few things that should be added to make the smart shopping cart more stable. To begin, the latency of wireless communication with the server must be considered in this project. Second, communication is not entirely secure. It is difficult to apply the barcode sticker to certain items. In such cases, traditional barcode scanning is more advanced. In comparison, a more advanced microcontroller and a larger display system can be used to provide a more user-friendly interface.

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