

Shopping Wagon: A Smart Shopping System Using RFID for Shopping Malls

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Abstract. This project describes a supermarket automation trolley based on an RFID reader. The trolley is equipped with an RFID reader and an electronic hardware system to make the transaction more convenient. The RFID card, whose price is set into the reader, is used to correct those items that are above a certain number. The value of the item is added to the sales bill and shown on the LCD monitor when the item is shown in front of the reader. The trolley car is programmed in such some way that it'll move consistent with the user command. It additionally has the supply for removing the things from the trolley car wherever price is aloof from the overall cost. The user can view their bill through IOT along with the number of items purchased and total bill amount. The user can also pay the bill using his card provided and the system will give an alert if the total amount exceeds the amount in the card. The system will also suggest the user whether the purchased product is suitable for their health condition or not through IOT app provided to the user.

Keywords. Microcontroller ATMEGA328P, RFID Tags, RFID reader, Liquid Crystal display, IOT.

1. Introduction

The Robotized Shopping Cart, “Shopping wagon”, is a modern patron shopping product this is designed to assist shoppers’ fast-tune their buying revel in. The idea of this clever buying wagon will revolutionize the shopping revel in of each buyer [1]. In these days each grocery store and shopping center uses purchasing baskets and purchasing carts to accumulate the gadgets from the racks. In the actual global we are facing many issues at the same time as status in a queue due to the fact we need to wait for a protracted time [2]. When we're in buying shops it's far simpler for us to take the buying cart and save anything we need however whilst we need to wait in a queue for billing the product that's a busy process. As a result, billing takes longer [3]. The RFID reader and IR sensors will be used in the wagon which is able consequently scan the item being entered into the cart. Once the item has been put into the Wagon, the information related to the item will be shown on the LCD screen introduced on the wagon or the smartphone of the shopper [4]. The data of the items put in cart will be

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communicated to the charging counter of the shop by means of IOT. This will lead to automatically billing up the items the client has put into the cart. Once the shopping of the client has been over, the ultimate charge will be shown on his smartphone [5]. This will radically diminish the shopping time of the client and make the shopping involvement less demanding [6]. The said conception will not only change the shopping experience of the buyer but it will also have great impact on the shop keepers. They will have access to real-time information about particulars that are being bought. The above idea will enhance consumer courting management. Introduction of this clever carts can be quite attractive withinside the retail zone and could result in a brand-new generation of purchasing and promoting of goods. It may be taken into consideration an affordable desire for capability retails for the reason that key hassle it addresses is saving the consumers time [7-9].

2. Existing System

In existing system, automation system reaches its goal only until the billing system at shopping malls even in developed cities. There is no any automated system to get and give all kinds of groceries to the customer based on his/her grocery list. To solve this kind of problem and take the automation to next level, we are proposing an idea by that customer can order from at any place by using smart phone app [10-12].

3. Proposed System

In the residing scene invention is growing grade by grade in numerous fields like faux astute, AI, digital reality, touch commerce, net of things, etc. The precept purpose of the paper is middle to the purchaser wishes and purpose because time is greater essential to anybody in reality. But the humans spend the greater time within the supermarket. Consumers, for instance buy a certain amount of goods in the store using a trolley. After making a purchase, they can encounter issues such as standing in a long line in the billing section and not knowing the total cost of the products purchased. So, we implement a system using IOT which consists of RFID reader and LCD display, while customer takes an object and placed within the trolley, that time, the reader scan the item and the amount of the product is added to the bill through IOT Server and it will automatically updated to the store in charge through IOT server and consumer also knows the value of money they spend on the items before billing [13]. So, they can add or remove according to the convenience and also they can pay the bill from their card itself using indoor localization [14]. The system also has automatic trolley set up which can be operated using IOT control switches. The system will also suggest the user whether the purchased product is suitable for their health condition or not through IOT app provided to the user in Figure 1.

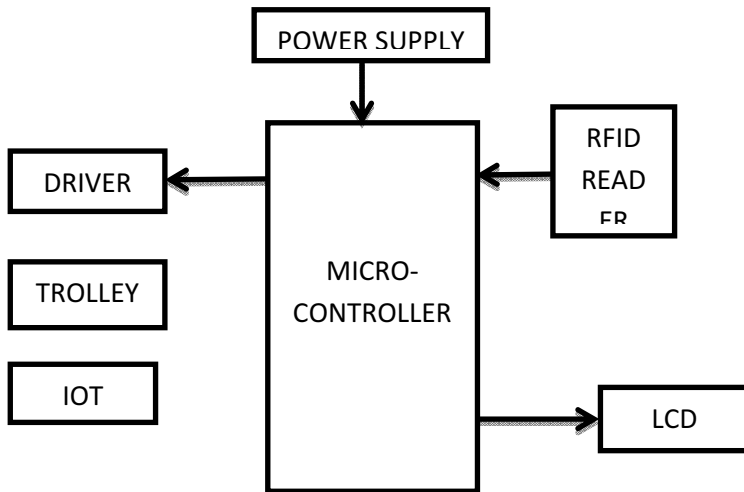


Figure 1. Shows the block diagram of the proposed work

4. Results and Discussion

In the arrangement there is a driver circuit - streetcar instrument present. This driver circuit has a 12 V ground supply. It has 4 information and 4 yield pins. The info is acquired from the regulator and the yield is associated with the engine. So relying upon the regulator input the engine yield changes. The code is given so that the engine pushes ahead, in reverse, turns and stops. . So for the proficient running of engines, driver circuit is utilized. Next RFID is available and it deals with UART communication (serial communication).

Figure 2, a UART communication, two UARTs discuss straightforwardly with one another. The sending UART changes over equal information from a controlling gadget like a central processor into sequential structure, communicates it in sequential to the accepting UART, which at that point changes over the sequential information back into equal information for the getting device in Figure 3. In this arrangement every one of the item's subtleties is perused utilizing RFID peruser and every one of the items has a secret string esteem remarkable to it. This information is then passed to the regulator and if the put away information is gotten the subtleties get shown in the LCD show. The code for expansion in includes and sum is put away in the microcontroller and it is shown in a LCD show of size 16x2(2 lines &16 coloumns) in Figure 4. The application chips away at IOT and the inside association is given utilizing a username and secret key. Here likewise information transmission happens through UART protocol (serial communication). Here remote exchange to cloud happens. A battery with 12 V is utilized as force supply and the force for all segments is given from it. The live updates of the item subtleties can be seen in the application.

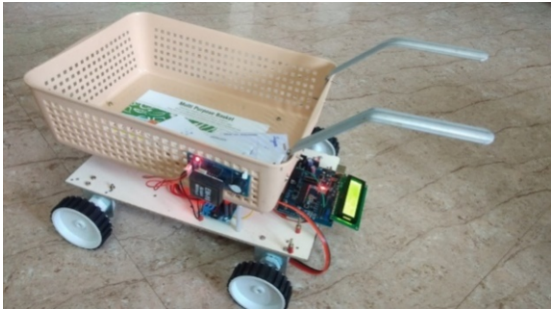


Figure 2. Shows the final output of developed product

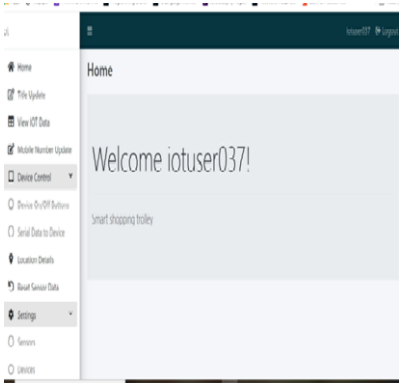


Figure 3. Homepage of IOT application

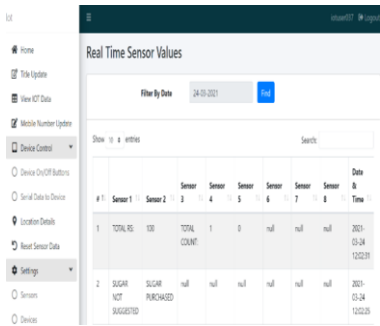


Figure 4. Real Time Sensor Values

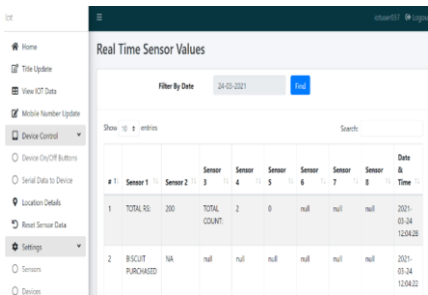


Figure 5. Real Time Sensor Product Values

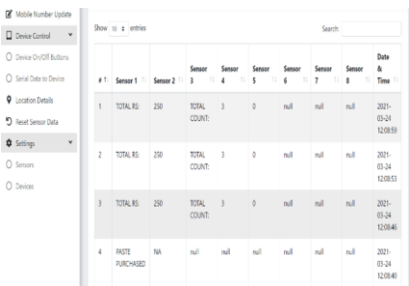


Figure 6. Next Product Sensor Values

Next product is added and number of products gets updated to 2 and then the total amount gets incremented by 100 after biscuit is purchased. Now the total amount is Rs.200. In Figure 6, the last product which the user adds is a paste of Rs.50. Now the total amount is incremented to Rs.250 and the number of products is 3. Since the user is done with the shopping she can pay Rs.250 via the RFID card provided to her.

5. Conclusion

The advanced product is comfortable to operate, low-budget and do now no longer need any unique training. Using RFID technology, this venture simplifies the billing process, makes it faster, and improves protection. This elevates the general shopping experience to new heights. A design for automated retail shop rested on RFID is established in this journal. This ground plan uses RFID technology to simplify, speed up, and improve the security of the billing process. Require the right direction toward the per user to be perused and any harm makes them mixed up. Also utilizing standardized tags is a human-escalated movement at the retail location. Consequently, RFID innovation is the better way to deal with defeat these deficiencies.

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