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# Supermarket Shopping Cart System Using IoT and RFID Technology

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**ABSTRACT:** In this Era of Internet of Things, interactions among physical objects have become a reality. Every object in this world are on the verge of getting connected together with the help of Internet. For Example, as in this paper we have introduced a new smart approach in shopping system. Here we introduce a new concept of billing the items of the customer without even having to wait in the long-lasting queue. We use RFID (Radio Frequency Identification Tag) which would attach on every purchase of an item. So overall the tag is less expensive, anyways this technique will solve to get rid of waiting in long Queues. So, every people must arrange their items in their respective carts, because the carts would be having an individual RFID reader, this prevents the customers rambling around in search of RFID readers. Due to this all the information like the cost of the item would be shown in the display so that the people would pay for their items instantly. To the best of our knowledge this is a smart system and this works on a smart basis using IOT. Hence this system should solve the current real time crisis

**KEYWORDS:** RFID, ARDINO UNO, ZIGBEE(TM), ZIGBEE(RC)

## I. INTRODUCTION

We see nowadays RFID's are broad and taking part in many progressed projects because of its quick and successful reaction.

RFID are for the most part labels that are utilized for exceptional ID of items by utilizing radio waves. These RFID's offer more benefits over ordinary Barcodes as they have a significant downside which is Line of sight innovation and furthermore these scanner tag labels have limitations in its solidness while the RFID's labels are more strong and ready to peruse/compose information which could even be scrambled. These labels could hold a lot of information like items name, value, size, weight and other data utilizing their recognizable proof

## II. RFID & BARCODE PROCESSING

RFID and barcodes are similar in that they are both data collection technologies, which means they automate the process of data collection. However, they also differ significantly in many areas. If compared, RFID technology is found to be simpler than the barcode technology.

Barcode scanner requires line of sight whereas RFID can be read without the line of sight. It is possible to scan RFID tags from a larger distance. An RFID reader can gain the information of the tag from a distance of about 300 feet, whereas barcode technology cannot be scanned from a distance of more than 15feet. Barcode coded items can only be read individually whereas multiple tags can be read by RFID reader simultaneously. RFID technology is better than barcode technology in terms of speed. RFID tags can be read much faster than the barcode tags. As it requires a direct line of sight, barcode reading is comparatively slower than the RFID tag reading.

### III.RFID & BARCODE APPROACHES

A barcode reader takes about one second to successfully interpret two tags, whereas in the sometime the RFID reader can interpret around 40 tags. RFID tags are well protected and implanted inside the product, and thus they are not subjected to too many wears and Tears. The barcode requires a direct line of sight to the printed barcode, because of which the barcode has thobe printed on the outer side of product, thus subjected to huge amounts of wears and tears. It is also limited to re-utilization of the barcodes. As barcode lacks with thread and write facility, it is not possible to add to the information that is already existing on it. The main advantage of using the RFID tags is that rewriting on RFID tags is possible.

**The output images can be seen as shown below.**

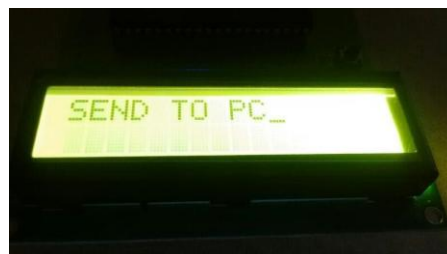
In the beginning, when the kit is switched on by providing the power supply to the kit, the below images are seen which show "WELCOME" on the LCD screen of the device.



When an RFID tag is scanned by the RFID reader, the images as shown below are displayed along with the details of the name of the product, weight of the product, cost of the product and the total billing amount

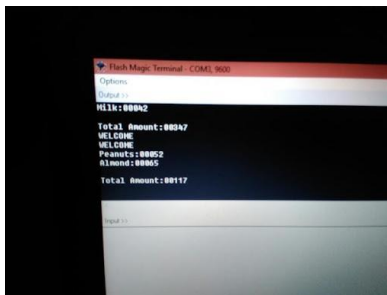


After completion of the shopping, press the shopping completed button. The image as shown below is seen and the information is sent to the PC using ZIGBEE technology.



The items with their individual costs and the total cost is displayed on the PC as shown in the below image.





#### IV.WORKING PRINCIPLE

In this system, we use ARDUINO microcontroller which acts as brain of the system, because the entire system program instruction stored in it. The concept consists of two sections in which, here in the trolley section we have an RFID reader that we fix at every cart trolley. RFID tags are attached to every product in a shopping centre so that we can assign separate IDs for every product. According to the product, how much it gets into the trolley, we get to know the weight of products as well as the amount how much it takes. Suppose once a product is read by a trolley, it is not able to list in other trolleys. A pressure sensor we use here to know the weight of the product. A switch is used to unread the unwanted product from the trolley by the user. All the data are transmitted to the account section with the help of ZIGBEE. Once the amount is billed, we can pay the bill by getting an OTP for the transaction after swiping our smart card. The delay of billing has been overcome. Here we have used IOT to monitor and control the entire system.

#### HARDWARE DESCRIPTIONS

##### ARDUINO MICRO-CONTROLLER

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. Over the years, Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, and their contributions have added up.

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