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Research Paper

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## Automatic Retail System Using RFID

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**Abstract:** To purchase essential commodities, people living in urban areas and in Metropolitan cities are looking out for marts which are having high quality brand items. The time spent by the people waiting for their turn to get the bill and pay the money is more than the actual time they spent in selecting the goods. In this paper an approach is tried to reduce the waiting time at bill counter using the RFID technology.

**Keywords:** Retail System, Billing Type, RFID, Passive Tags, RFID Reader.

### I. INTRODUCTION

There is a vast change in shopping methodology. From local markets people are moving to marts. The reason is simple; they get all their required things under one roof, from vegetables to cosmetics. But everyone will agree from one problem of standing in long queue for billing even though people have electronic money now. Ultimately people have to compromise with either their precious time or with the number of items purchased.

Since we are living in 21st century with great technologies, we can have a very good method of paying our bills in no time. Think of purchasing of a large number of items with the ready payment bill as soon as you finished shopping. Surely it will save our time. In this paper the same idea is developed using latest technologies.

In the introduction section, the problem of usual shopping and billing scenario was reported. In section II, the problem statement is explained using a flow chart. In section III, the entire prototype and technologies for the proposed system are to be addressed.

### II. PROBLEM STATEMENT

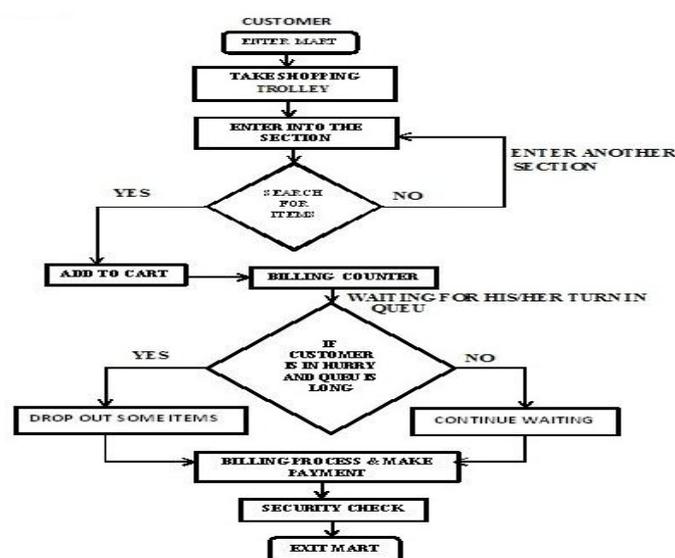


Fig. 1 Flow chart showing current problem

Normally, we enter into the mart, take the shopping trolley and go ahead for shopping. We keep moving into all sections and put things of our choice into the shopping trolley. After that we go to billing counter. We have to stand in a queue and wait for our turn and when our turn comes we have to again wait for our bill because barcode of each and every item is to be scanned for preparation of the bill. A lot of time we spend on searching and selecting items, which is alright because we want the best one but waiting and spending our time for bill generation process, is obviously very tiring. Electronic cash has made the payment easy but creation of the bill is still very time-consuming. We are bound to wait for the bills, even if we are in hurry. A simple flowchart of above mentioned process is shown in fig 1.

### III. METHOD TO OVERCOME LONG QUEUE

As we have discussed about the common problem we face while shopping in the mart, now we will discuss how we can solve it. Firstly, it is quite important to find and understand the reasons behind it. In the next paragraph we will analyse all the problems and then we will explain our proposed idea for the solution.

So, after analysing the flowchart in fig 1, work is to be done in the second part i.e. after 'Billing Counter' part. Long queue not only irritates the customer but also decreases the business. Reason is simple: larger the number of items more will be the time taken to wait in the queue.

To scan their barcodes, this generally happens as most of the people just not go to purchase one or two of the items in the mart. We can't limit the number of items what we can do is to discover some idea which do the scanning of the barcodes quickly and generates the bill as fast as possible. So, we have one solution which we are going to explain in the next section (fig. 2).

In our proposed idea we have made the modifications in the second part of the flowchart (fig 1). Instead of using simple barcode reader we will use RFID tag reader. Therefore each item for the sale should have passive RFID tag.

The RFID tag reader will be attached with each trolley. When the customer puts the selected item in this special trolley, it will read its tag. Reading of the tag is equivalent to the scanning of the barcode of items. Thus a simultaneous scanning of the items will save time. Since there are some loose items (like grains, pulses, etc.) also present in the mart, so there will be a provision of manual entry of the codes and prices in the shopping trollies.

All these scanned & entered data will be monitored and stored by a centralized computer. But this storage is to be done for each customer/trolley so a unique identification (ID) number will be there for every RFID reader. The RFID reader is wirelessly connected with a computer at a remote place. This computer may be placed at the bill counter. The computer acts as the server at which various RFID readers are connected as wireless nodes. This will help the computer to generate separate bills for that particular ID i.e. customer. As soon as the customers will end up with their shopping they will move to the bill counter to collect their pre-calculated bill and make a payment.

As shown in the flowchart of the fig.2, customers will enter into the mart and will take their modified shopping trolley. When they will put any item, the RFID reader will read its price and code. If they select any loose item then that code and price will be entered manually.

All these data will be stored under the unique ID of the customer. After finishing their shopping customers will collect their bill at the bill counters. Since now they have to only collect their receipt and make a payment, so there will be no more chaos at the bill counters. And then they can exit after security check.

Execution of this methodology will definitely remove long queue at the billing counter with saving of customer's time.

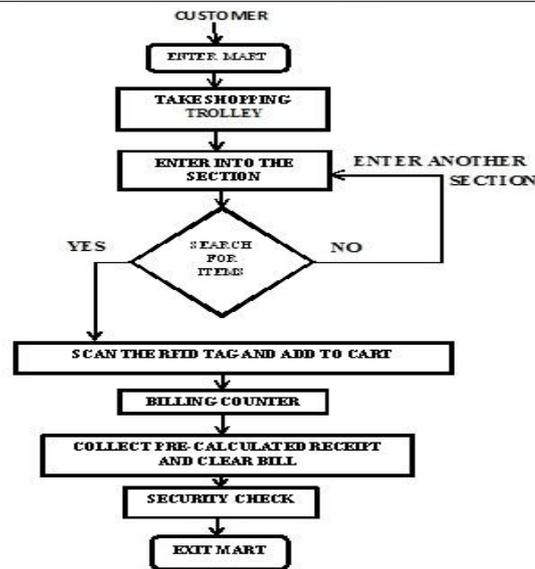


Fig. 2 Flow chart showing proposed methodology

#### IV. CONCLUSION

The 'Long Queue' is a tiring and boring factor when people want to purchase commodities from marts. Though people can pay instantly using electronic money facility, they are forced to wait in the queue for longer time which kills the time of so many people. The algorithm which is proposed using RFID technology tries to overcome the problem and it gives much shorter time duration to wait in the queue. Thus with the implementation of this algorithm, it is possible to have smooth and faster processing at the bill counters of various marts.

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