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STUDY OF EFFICIENT MALL BILLING SYSTEM USING TECHNOLOGIES LIKE NEAR FIELD COMMUNICATION & ELECTRONIC DATA CAPTURE

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ABSTRACT

This research draws upon the pattern of using technologies like Bar Code Reader, Near Field Communication (NFC) Tags, LED's and Electronic Data Capture (EDC) to reduce the Time Complexities which are being faced by the end consumers while paying the bills in the malls.

This focus undermines our work on time reducing concepts through these technologies. Most prior researches on this topic have emphasized on reducing time complexities. We have enunciated on the consumer experience too. This case example shows how different technologies can be collectively used to enhance user-experience and reduce the overall time taken at the Billing Counter.

KEYWORDS: Bar code reader, Mall, LEDs, NFC, EDC, Counter, Efficiency, Complexity.

INTRODUCTION

In recent times, mall culture has seen an increased follow up resulting in an upward trajectory in the number of customers at different shopping malls. This has led to a considerable increase in total time consumed, especially at the billing counters. The traditional billing system is the main reason for this increased time complexity and our project targets to make up for the loss. Prompt and quick service will definitely result in the increase of regular customers.

For this, we plan to introduce new methods and changes in the billing system. Introducing technologies like EDC (Electronic Data Capture), NFC (Near Field Communication), and LED (Light Emitting Diode) screen, Bar Code Reader and Scanner.

PROBLEM DOMAIN

While shopping, we all have experienced a hassle which is created at the billing counters mainly during sales in the supermarket.

There is a lot of rush at the counters due to which they fail to meet the expectations of their customers, leaving them unsatisfied and frustrated.

Some of the problems faced by them include:

1) More time required - The large crowd leads to longer and mismanaged queue at the counter. Hence taking more time to pay the bill of the goods as compared to the time taken by them to purchase.

2) Irritation and frustration - Most of the people don't like standing in the queue for long time and want their work done faster. For some customers, this frustration increases when they have only 1 or 2 products and have to wait for a longer time. As a result in some cases, they cancel their products.

3) People come with certain budget in mind, but while shopping, they exceed it unknowingly. They realize this at the time of billing and then they are forced to cancel some products leading to more consumption of time.

ARCHITECTURE & METHODOLOGY

To eliminate the above stated problems, we have made some preliminary design changes in trolleys and billing counters such as:-

- ➢ In TROLLEYS:-
- Introduction of Bar Code Reader at the edge of the trolleys to scan the item.
- Installation of LED SCREEN on the rim of the trolley which will display
    1. Number of items
    2. Total amount
    3. Counter Number(Generated Post Shopping)

Electronic Data Capture (EDC) - If the customer has a credit card and wants to pay using one, they can directly swipe their card through the machine installed on the trolley after which they will collect the bill from the counter and leave the complex.

- ➢ Billing Counter

We plan to esthetically change the overall design of the billing counters by dividing them on certain parameters. There would be some counters for those who have paid through EDC and have to go to the counter for the checking of total number of products only. Then, other counters will be divided on the number of products purchased.

Now, since we are considering that the customer scans and then puts the item in the trolley, there might be chances where someone forgets or purposely doesn't scan the item. So there would be a need to cross verify the number of items at these counters. For this, we are using algorithms namely Priority Scheduling, First Come First Serve, Shortest Job First, and Round Robin which will guide the customer to the counter where they will get their work done faster. This will be done by displaying the counter number on the LED screen which will be connected to the counters (as explained earlier) and the person will be sent to that counter where there are least number of people.

Using NFC (Near Field Communication) tags on special types of tokens, this smart technology detects the tag when it comes within a range of 10-15 cm.

Working of this technology will be:

Every counter will have a separate area for forming queues. As the customer gets in and inserts the token, counter will increase by one.

Every trolley will have a token. As soon as the customer finishes the shopping, they will go to the billing counter and insert the token in the barricade. With this token, the customer will be able to go in the queue. This method of entry will help us know the exact number of people standing in a particular queue. The allotment of counter will be via the above mentioned algorithms.
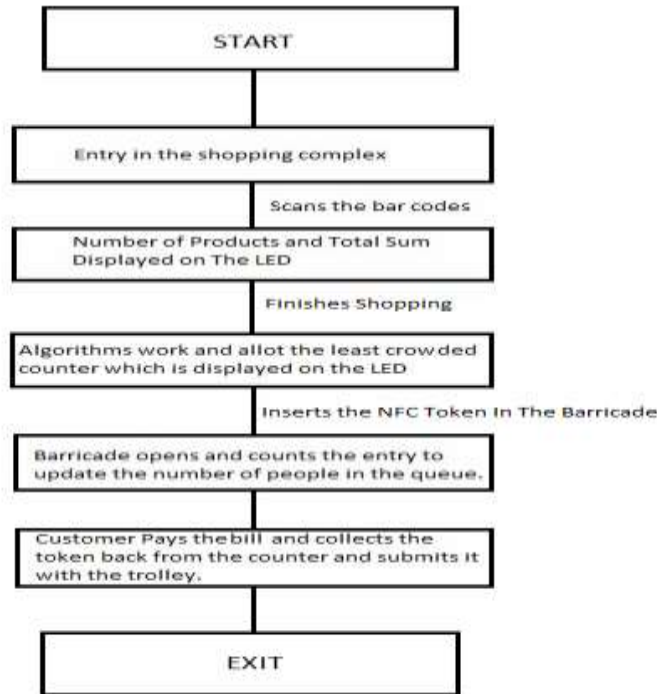
Figure 1: Flow diagram of trolly based billing system

FUTURE ENHANCEMENT

We plan to make it bigger by making some more changes to our project. We will use more enhanced technologies for making it simpler for the customers, and much more cost effective.

We seek to find or create such a technology in which as soon as the item gets placed in the trolley, it will get scanned irrespective of the fact that the person has passed it through the Bar Code or not. If this is achieved, the counting of number of items will not be required then and the customer will directly pay for the total displayed on the screen and leave with his goods.

CONCLUSION

The selection of this topic was done to reduce the extra time taken while shopping and by the use of advanced technologies, changes in the trolley and malls we have justified our project. This model will definitely be successful because of its efficiency and effectiveness. With the world getting faster day by day, this surely is the need of the hour. Talking about the chances of the success and failure of this design, anyone who wants to save their valuable time will definitely prefer the market with such services. Undoubtedly, there will be increase in their sales as its very easy for customers to use and will save the time of the workers at the malls or shopping complexes also. There might be some who come just to see the new changes in the working of the trolley and other technologies and ultimately it will result in increasing the sales.

So this will not only favor the customers but also the shopping malls and supermarkets.

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