A Study on Automated Billing System Using Radio Frequency Identification Technique

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ABSTRACT: Shopping has been an important part of our day to day life. People shop on various occasions such as festivals, for a vacation or just for fun these days. Every shopping mall has one common things amongst them 'The Shopping Cart'. In the existing system, a lot of time is wasted at the checkout counter when the customer has already spent a certain amount of time in picking up the items they need.
To counter the problem of waiting queue in malls, we have proposed E-Trolley concept. We came up with an idea which overcomes this problem and increases efficiency by reducing the checkout time and the long queues for it. All the products will be having RFID (radio frequency identification) tags and there will be sensors at the bill counters. As soon as the customer crosses the counter, the RFID fixed in the counter will sense the signals from the product tags and the items in the cart will show up on the final bill. There will be no need to scan each and every product in the cart and wait in a queue at the checkout counter. We will just need to pass through the counter and the bill will be automatically generated. Hence, the disadvantage of waiting queue, scanning every product one by one, damaging of bar codes on product will overcome by using this E-Trolley and hence save time of the customers.

KEYWORDS: RFID tags, radio frequency identification, barcode readers, sensors, bills, products, E-trolley, queue, signals, manual work, smart trolley, electromagnetic field, line of sight, microchip, billing counters, queue, display screen, shopping cart.

I. INTRODUCTION

The main component used in our project is RFID(radio frequency identification technique).RFID uses radio frequency electromagnetic field.It is made up of a chip. Our project is based on RFID. RFID (Radio Frequency Identification) is basically automatic identification technology which uses radio frequency electromagnetic field to identify objects carrying tags when they come close to a reader. A tag can be read from several feet away and does not need to be within direct line of sight of the reader to be tracked .The system is made up of two parts: a tag and the reader. The RFID component on the tags have 2 parts: a microchip that stores and processes information and an antenna to receive a signal. We have proposed an E-Trolley concept.We came up with an idea which overcomes this problem and increases the efficiency by reducing the check-out time and the long queues for it. All the products will be having RFID i.e. Radio Frequency Identification Tags to products and sensors to the bill counters. As soon as the customer crosses the counter, the RFID fixed on the counter will sense the signals from the product tags and the items in the cart will automatically show up on the final bill. There will be no need to scan each and every product in the cart and wait in a queue at the check-out counter. We will just need to pass through the counter and the bill will be automatically generated. Hence the disadvantage of waiting queue, scanning every product one by one within line of sight, damaging of barcodes on product will overcome by using e-trolley named as 'SMART TROLLEY' concept and hence save time and increase efficiency.

II. WHAT IS SMART-TROLLEY?

Smart-trolley is the concept derived to counter the problem of existing system. In this system, we are going to place an RFID tag to each of the product in the mall.At the master entry, we will enter all the details regarding this product into master database.As soon as the customer will pass through the counter, bill will be generated. The reader placed on the counter will scan each product through radio frequency identification technique.It needs only a simple one stroke scan over the billing counter. All the products will be having RFID i.e. Radio Frequency Identification Tags to products and sensors to the bill counters. There will be no need to scan each and every product in the cart and wait in a queue at the check-out counter.This will simplify the whole process, no time is wasted in maintaining queue. A tag can be read from several feet away and does not need to be within direct line of sight of the reader to be tracked. This system reduces the manual work.
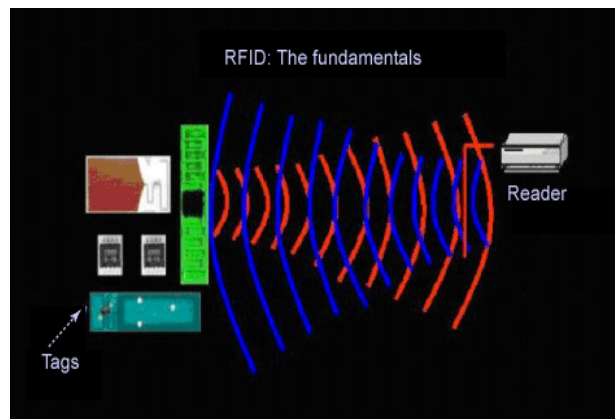

Fig.1.RFID Fundamentals

1. In this system, we are going to place an RFID tag to each of the product in the mall.
2. At the master entry, we will enter all the details regarding this product into master database.
3. When a customer purchases any product, he will simply add to his cart. When he moves toward billing, the authority will simply make a one stroke scan over the cart.
4. As soon as the scan is made, which will hardly require 1-2 seconds, bill will be generated.
5. This will simplify whole process, no time is wasted in maintaining queue.

III. TECHNOLOGIES USED

Radio frequency identification (readers & tags):RFID(radio frequency identification technique).RFID uses radio frequency electromagnetic field.It is made up of a chip. Our project is based on RFID. RFID (Radio Frequency Identification) is basically automatic identification technology which uses radio frequency electromagnetic field to identify objects carrying tags when they come close to a reader. A tag can be read from several feet away and does not need to be within direct line of sight of the reader to be tracked .The system is made up of two parts: a tag and the reader. The RFID component on the tags have 2 parts: a microchip that stores and processes information and an antenna to receive a signal.

Fig.2.Tags

Fig. 3.Reader

IV. PROS AND CONS

Advantages:
1. There will be no waiting time wasted in queues as we are using smart trolley concept.
2. A tag can be read from several feet away and does not need to be within direct line of sight of the reader to be scanned.
3. The tags will not get damaged as they are not easily broken.
4. It also helps in reducing the manual work.

Disadvantages:

1. Due to tag and readers there will be High initial investment.
2. Many countries have different rage of frequencies that allow RFID tags to function.

V. APPLICATIONS

1. Shopping malls: This can be mainly used in shopping malls for decreasing the waiting queues.
2. Super Markets: People can easily get their bills without waiting in queue
3. Airports: This can also be used in shops present at airport or also within the airport for luggage purpose.
4. Medical Stores: We can stick these tags on all the medicines or tablets present in medical.
5. Library: Librarians can also use these tags for renovation and issuing of books in schools and colleges.

VI. CONCLUSION

The objective of this project was to build a program for maintaining the details of all Supply Order .The system developed is able to meet all the basic requirements. It will provide the facility to the user so that they can keep tracks of all the equipments being supplied. The management of the Inventory will be also benefited by the proposed system, as it will automate the whole supply procedure, which will reduce the workload. The security of the system is also one of the prime concerns. There is always a room for improvement in any software, however efficient the system may be. The important thing is that the system should be flexible enough for future modifications. The system has been factored into different modules to make system adapt to the further changes. Every effort has been made to cover all user requirements and make it user friendly.

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