Product Identification And Monitoring System Using Smart Shopping Cart

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Abstract- *Shopping malls allow the customers to shop variety of products under one roof. Since it does not need the customers to go to various shops to buy different products, shopping in malls helps save the shopping time. Because of this, many people have started shopping in malls making them more and more crowded. So, besides this big advantage, there is a major disadvantage of long billing queues taking much longer to bill the purchased products. Therefore, it becomes pointless to go to shopping malls in order to save time. So, if there were a system to generate the bill of shopped products automatically or simultaneously then it could save the billing time thereby revoking any need to stand in long queues. There are various techniques such as barcode scanner, camera, RFID tags and codes to generate the shopping bills on trolley itself to make the shopping trolleys smarter by introducing self-billing upon them.*

Keywords- Radio Frequency ID, Auto Identification technology (Auto ID), Product Identification, Shrinkage, Shrinkage Management, Electronic Article Surveillance (EAS), Billing, Trolley system, Electronics Product Code, Futuristic Billing Trolley, RFID tags/device, RFID Module, RF Transmitter, RF Receiver, Templet, Self- scanning process, Demodulating Radio Frequency Signal.

I. INTRODUCTION

The purpose of this paper is to explore the possibilities offered by recent developments within the sphere of product Auto Identification (Auto ID) technologies to impact upon the problem of shrinkage in the retail sector and their suppliers (both manufacturers and third-party logistics providers). Its purpose is not to provide specific strategies for its implementation, but to consider the potential to impact upon shrinkage in the short, medium and long term. In this respect, this document aims to generate discussion, debate and above all, raise questions about how this rapidly developing technology might be used, rather than to be overtly prescriptive in suggesting how it should be used.

The paper begins by looking at recent developments in radio frequency identification and tagging technologies, as well as the existing and, in some instances, well-established forms of product identification. It then goes and the difficulties associated with tackling it. Without a clear understanding of the problems of shrinkage and shrinkage management, it is impossible to begin to identify the prospects offered by Auto ID. It continues with a review of some of the technological approaches currently adopted to tackle shrinkage, in particular the application of Electronic Article Surveillance (EAS).

It then goes Auto ID and Shrinkage: Scoping the Potential on to look at specific ways in which it may be used to tackle some of the disadvantages of long billing queues taking much longer to bill the purchased products. It concludes by assessing the overall issues relating to the implementation and eventual use of Auto ID in the business community.

The main objective of this paper is to develop a low-cost intelligent shopping aid that assists the customer to locate and select product/s and inform them on the product/s details dynamically as they move in the shopping arena. Additionally, with each product identified uniquely and usage of centralized server, support billing and inventory updates will be provided.

The Management System Like a bar code, a Radio Frequency tag is a data carrier. While a bar code carries data in a visible symbol and is read at optical or infrared wavelengths, an RFID device (or tag) carries data programmed into a chip and operates at radio frequencies, typically 125 KHz, 13.56 MHz, 2.45GHz and around 900MHz. The management system of RFID is the nerve center for the application and forms part of the RFID user's information technology system. It is responsible for using the data received from and sent to the RFID tags for logistics and commercial management. For communications to begin between a reader and a tag the reader must first recognize that tags are present in its 'field'; it must then be able to recognize each and every relevant tag in its field. Readers are also capable of reading all or only relevant parts of the data depending on how the system is programmed

II. SYSTEM DESIGN

In the Trolley system, each product will have the passive Radio Frequency ID tag which is bearing a unique

Electronic Product Code. This Electronic Product Code provides the info like name, price etc. about the product. When then customer will put the product in the Trolley, the Radio Frequency ID scans then tag and the Electronic Product Code number is known by Radio Frequency ID reader. Radio Frequency ID reader passes the Electronic Product Code to the ARM 7 micro-controller where ARM 7 compares the Electronic Product Code with the database of the system containing various products. After that the name, price and expire date of the product obtained by the ARM gets displayed on the LCD display of the Futuristic Billing Trolley, where user can see the product information. The ARM 7 microcontroller also passes the data obtained from the database to the RF transmitter from where the data is wirelessly transmitted to the billing computer. The master computer receives this data through RF receiver using Max 232 interface. Max 232 interface is the interconnection media between the RF receiver and the computer.

1. Trolley Unit In this unit the ARM processor is attached to a RFID reader and barcode reader. As the user puts the items in the trolley the reader on the trolley reads the tag and sends a signal to the ARM processor. The ARM processor then stores it in the memory and compares it with the lookup table. If it matches then it shows the name of item on LCD & amp; also, the total amount of items purchased.
2. Billing Unit As soon as the shopping is over the user comes near the billing section. The total bill will display on the billing computer.
3. RFID Tags are of two types: passive tags which have no battery life and active tags which have battery life. RFID tags released for automatically identifying a person, a package or an item. These are transponders that transmit information. RFID tag contains two parts. One is integrated circuit for modulating, storing and processing information and demodulating radio frequency (RF) signal. The second is an antenna for receiving and transmitting signal.
4. RFID Reader RFID reader consists of an RF module that acts as a transmitter and receiver of radio frequency signal. Transmitter consists of an oscillator to create the carrier frequency; a modulator to make impact on data commands upon this carrier signal & a receiver that contains demodulator to extract the data returned.
5. LCD Display LCD has the ability to display numbers, characters & graphics. The display is interfaced to I/O port of microcontroller. RF Module, RF module consists of RF transmitter and RF receiver. It is a small electronic circuit used to transmit and receive radio signal. It selects one out of a number of carrier frequencies.

Types of RF module are: 1) Transmitter module 2) Receiver module 3) Tran receiver module

Expected output:

The time required for billing in the shopping malls is reduced by self-scanning process also we deduct the product from the trolley as well as keep eye on shopping budge. We also get expire date of a product as we scan it. Thus, the precious time of each customer consumed during billing at billing counter is reduced.

BLOCK DIAGRAM

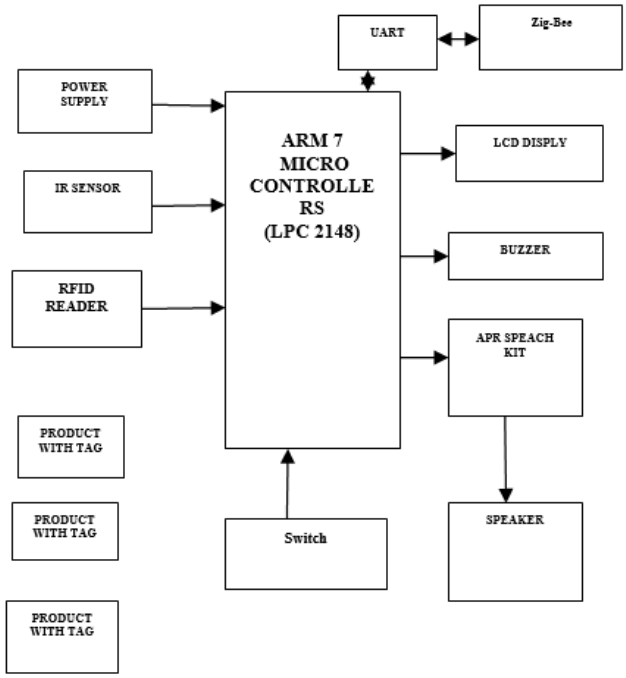

Fig.1

Billing Unit:

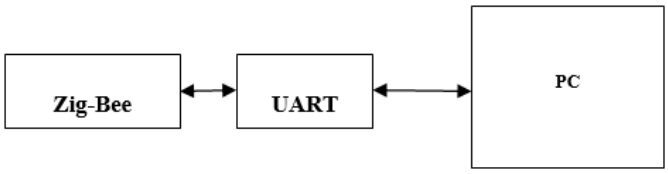

Fig.2

Hardware Requirements:

Arm Microcontroller
Power Supply Unit
Rfid Reader
Rfid Tags

Speach Kit
Speaker
Ir Sensor
Lcd Display Unit
Buzzer

Software Requirements:

Keil version 4
Embedded C
Flash magic
Express PCB

III. CONCLUSION

The time required for billing in the shopping malls is reduced by self-scanning process also we deduct the product from the trolley as well as keep eye on shopping budge. We also get expire date of a product as we scan it. Thus, the precious time of each customer consumed during billing at billing counter is reduced.

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