

## SMART TROLLEY IN MEGA MALL

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### ABSTRACT

Microcontroller based design has acquired the status of more happening field in electronics. This is highly specialized field that has the power of integrating thousands of transistors on single silicon chip. Nowadays in mall for purchasing number of items it requires trolley. Every time customer has to do calculations of those items & need to compare it with his budget in pocket. After this procedure, customer has to wait for billing. So to avoid headache like pulling trolley, waiting in billing queue we are introducing new concept that is "SMART TROLLEY IN MEGA MALL". In modern area for automation of mall we are developing a microcontroller based TROLLEY which is totally automatic. It follows the customer while purchasing items & it maintain safe distance between customer & itself. Only customer has to hold the Colour code side of the product wrapper in front of colour sensor. By using this trolley customer can buy number of products in very less time with less effort.

**Keywords-** Microcontroller, Thermal Printer, Colour Sensor, LCD

### I INTRODUCTION

Currently, human lifestyle has changed. Day to day life of a ordinary human being has become a lot more hectic. Time has become money. So, people actually do not have much time to spend for shopping which is an inevitable thing. That is why people prefer shopping in the malls so that they can get all the products at the same place. This saves them from going into different shops to purchase only a limited type of products. Though shopping in malls gives the benefit of saving time to people, they have only weekends to visit shopping malls.



**Fig.1 Trolley in Mega Mall**

This makes a problem at the cash counter because of increasing number of consumers. The customers have to stand in the billing lines for a lot more time than actual shopping time sometimes.



**Fig.2 Billing lines in mega mall**



**Fig.3. Rush at Payment Counter**

Seeing the general Indian population and way of thinking, In the existing, in the mall every person takes product put into trolley. After the shopping is done that person have to stand in the queue for billing.

In the billing process a sell person scan barcode of each and every product and gives final bill. This process is very time consuming and it becomes worst on holidays, special offers or weekends. The solution to the problem has been given by smart trolleys using different techniques till date. There have been a number of methods designed for smart spending carts in order to make shopping easier for the customers in malls and save the time of customers by avoiding the requirements to stand in long billing queues.



## **II LITERATURE REVIEW**

[1]This paper introduced new concept that is “SMART TROLLEY IN MEGA MALL”. In modern era, for automation of mall they developed a microcontroller based TROLLEY which is totally automatic. Only consumer has to hold the barcode side of the product cover in front of the barcode scanner. Then corresponding data regarding product will be shown on display. By using that trolley, customer can buy large number of product in very less time with less effort. At the billing counter side, computer can be simply interfaced for confirmation and bill printout.

[2]In this paper, we seem it fit to propose the “Intelligent Shopping Cart” which aims to reduce ,and possibly eliminate the total waiting time of customers, lower the total manpower requirement for markets and increase efficiency overall. In a world where technology is replacing the ways we pursue everyday activity, the future of the retail industry also lies in more and more automated devices.

[3]This paper presents a new technique that uses MIFARE tags and card reader to make the shopping trolleys smarter by introducing self-billing upon them. These systems mainly use the techniques such as barcodes, QR codes, RFID tags, smart cards etc. The newly proposed system with the technique of MIFARE tags can prove to be a better solution to the problem of longer waiting time in billing queues by facilitating billing on trolley and keeping the invoice ready by updating it simultaneously. The system seems similar to the system using RFID tags but differs in operating frequency, scanning distance and mainly the availability of tags. MIFARE tags are available in different shapes and sizes so that they can be fitted to any kind of products easily.

[4] In this paper The smart trolley will have RFID reader, LCD display. When a person put any product in the trolley it will scan and the cost, name and expire date of the product will display. Cost will add into final bill. Bill stored in microcontroller memory. It will transfer from RF transmitter to RF receiver. Receiver will transfer this information to the PC through serial communication. For this project we used Embedded C software. In this paper we conclude that, the time required for billing in the shopping malls is reduced by scanning process also we deduct the product from the trolley as well as keep eye on shopping budget. 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.

This system can be more advanced by using GPS, Zigbee and other communication system.

There have been a number of systems designed for smart shopping carts in order to make shopping easier for the customers in malls and save the time of customers by avoiding the requirements to stand in long billing queues. These systems mainly use the techniques such as barcodes, QR codes, RFID tags, smart cards etcThe newly proposed system will basically involve self-billing upon the trolley in order to save the time and skip standing in long queues.

## 2.1 Motivation

Reason behind choose micro controller based system:

In this paper we have designed system by using micro controller, because micro controller based systems are

- Less bulky & also easily transferable. It requires less power. So the system becomes chip,
- Friendly & Cost Effective.
- User friendly & cost effective.
- It operates on less power & requires less space.

## 2.2. Generic Approaches

Micro controller based design has acquired the status of most happening field in electronics. This is highly specialized field that has the power of integrating thousands of transistors on single silicon chip. Nowadays in a mall for purchasing variety of items it requires trolley. Every time customer has to pull the trolley from reach to rack for collecting items and at the same time customer has to do calculate of those items and need to compare it with his budget in pocket. After this procedure customer has to wait in quick billing so to avoid headache like pulling trolley, waiting I billing queue, thinking about budget. We are introducing a new concept that is SMART TROLLEY IN MEGA MALL

## III STRUCTURE

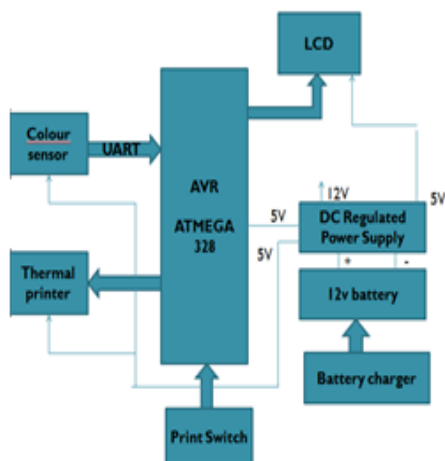


Fig.3.1. Block Diagram



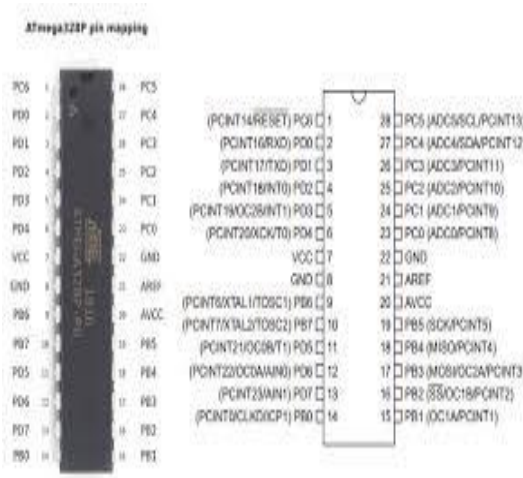
Fig.5. Proposed Trolley

**Colour Sensor:** The traditional colour sensor output only match/no match condition. The output for analog values for each R, G, B. It is 2 to 5 times faster speed for fast manufacturing. Highest resolution & repeatability in the industry. It is a pc based configuration.



**Fig.6. Colour Sensor**

**Microcontroller:** AVR is a family of Micro controller developed by Atmel beginning 1996. This are modified Harvard architecture 8-bit RISC single chip micro controller. AVR was 1st micro controller to used on-chip flash memory for program storage as opposed to 1time programmable ROM, EPROM or EEPROM used by other microcontrollers at a time. AVR microcontroller find many applications as embedded system They are also used in popular AURDINO line of open source board designs.



**Fig.7. Microcontroller**

**Thermal Printer:** These printer are commonly used fax machine, calculators & although they are inexpensive & print relatively fast, they produced low resolution print jobs. A thermal printer or thermal wax-transfer printer, thermal transfer printer is invented by jack kilbee that uses thermal wax ribbon to melt colour wax on paper for photo print.



**Fig.8. Thermal Printer**

**Reset Switched:** A reset button is on outside of computer that user can push to reboot i.e. restart the computer without switched OFF & back on again. This capability is useful in the event of system crash, i.e. situation in which



computer stop responding to keyboard & a mouse commands. The reset button can be more convenient It is also might be less stressful for the computer circuit boards.

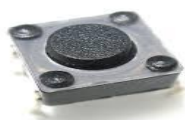


Fig.9. Reset Switch

**LCD Display:** The liquid crystal display [LCD] has advantages having low power consumption than the LED. It's a typically of order of micro watts display in comparison to some order of milli watts of LEDs. Its compatible with MOS integrated logic circuit . Its low cost & good contrast. It's a limited range of operations.



Fig.10. LCD

**Rechargeable Battery:** It's a rechargeable & storage battery. It can be charge or discharge into load & recharge many times. Rechargeable batteries typically initially cost more than disposable batteries



Fig.11. Rechargeable Battery

## IV CIRCUIT DIAGRAM

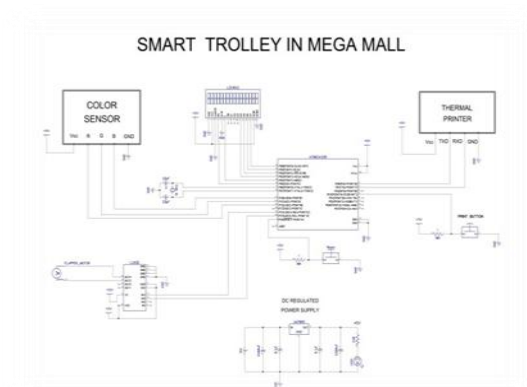


Fig.12. Circuit Diagram

## V PCB LAYOUT

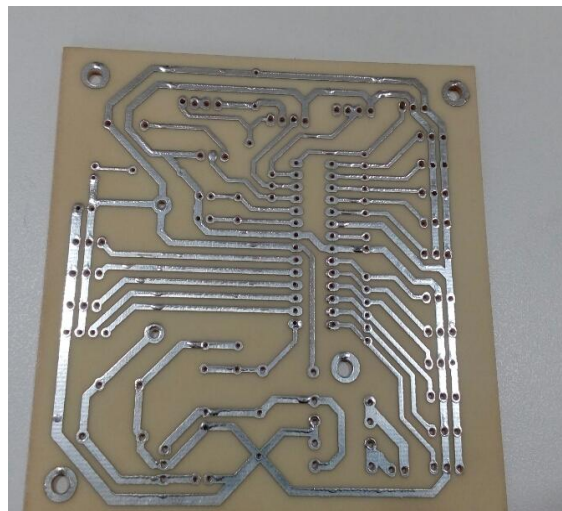
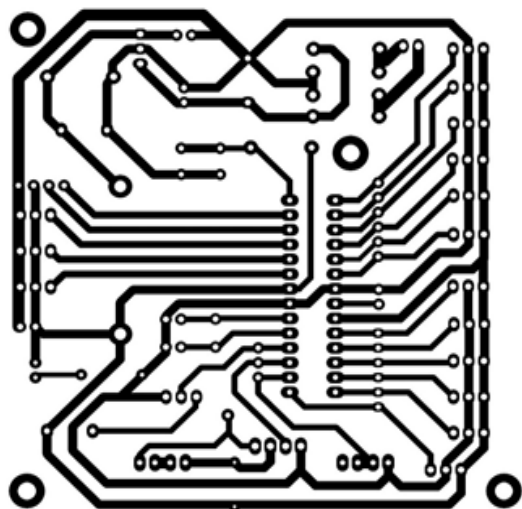


Fig.13.PCB Layout

## VI FLOW CHART

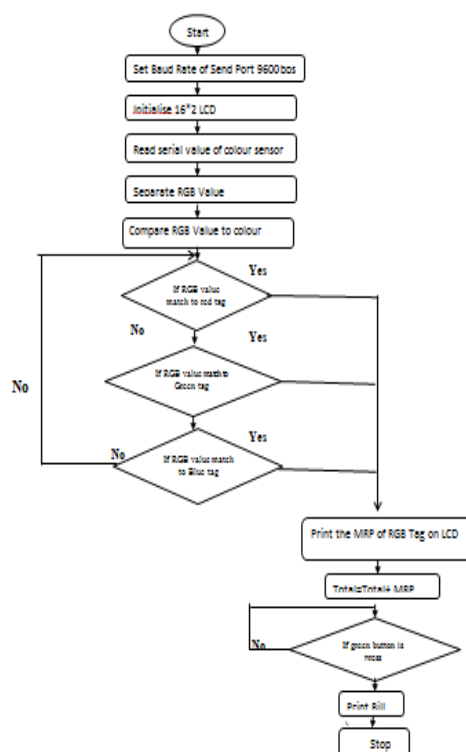


Fig.14. Flow Chart



## **VII APPLICATIONS**

It is very useful concept for mall

## **VIII ADVANTAGES**

1. Each colour code has unique identity .
2. Colour code gives total information about product related data.
3. Colour code maintains secrecy .
4. Easy to generate tags of colour code.
5. It creates a better shopping experience for the customers by saving their time.
6. It minimizes the man-power require at the shopping mall, as the checking- out process at the checkout counters is eliminated altogether.
7. It handles cases of deception if any thereby making the system attractive not only to the customers but also to the sellers.

## **IX CONCLUSION AND FUTURE SCOPE**

The project successfully demonstrated the possibility of using WSN for developing of smart shopping system which automates the entire billing procedure. The system which developed is highly reliable, fair and cost effective. It is reliable and fair because of the effectiveness of WSN combined with a highly reliable image processing technique. The system is also energy constraint as it uses a passive sensor and it reduce the communication requirement. The decision making process is done locally within the cart thereby eliminating an overhead to the communication between the motes. Also the application does not use of complex routine mechanism transmission our implementation makes use of the simple technology.

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