

SMART TROLLEY

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ABSTRACT:

With the advancement of technology, the level of acceptance of people of all ages towards electronic gadgets is increasing steadily. Electronic gadgets such as barcode scanner, smart card reader and RFID scanner are gaining more and more usage in various kinds of industries. The same applies to shopping malls. Before, people did their shopping at grocery shops or mini markets. As the number of large scale supermarket increased over the years, people started to prefer the shopping mall. As a consequence, shopping mall technology has to be constantly updated to fulfill the needs of consumers. Thus, a smart trolley with RFID is proposed by this project as an effort to replace the existing barcode technology. A RFID scanner with LCD display will be attached to the shopping trolley so that consumers can scan items they want to purchase into the shopping trolley. This does not only inform consumer of the total price of items as they shop, but also ensures that price of every item is available. This system is built using Microsoft Visual basic 6 as the programming language and also Waterfall Model as the system development model. This system is built for use with an RFID scanner.

KEYWORDS:

Ir Sensor, Rfid , LCD, DC Motor, Switches, Joystick, Microcontroller.

INTRODUCTION:

Shopping mall is a place where most people from all walks of life will get their daily necessities ranging from food product, parcels, toiletries; gardening tools electrical appliances, and others. The numbers of small and large shopping malls keep on increasing over the years throughout the globe due



to the demand of the public. Thus, the level of advancement of shopping mall system and infrastructure also varies.

Compared to some foreign countries' shopping mall system, there are still plenty of spaces for improvement in terms of providing quality shopping experience to the consumers. Consumers often face problems and inconvenience when shopping.

These problems include worrying that the amount of money brought is not enough for paying all the items wanted, insufficient information of the items that are for sale and also wasting unnecessary time at the cashier. These are the problems that are currently faced by most consumers.

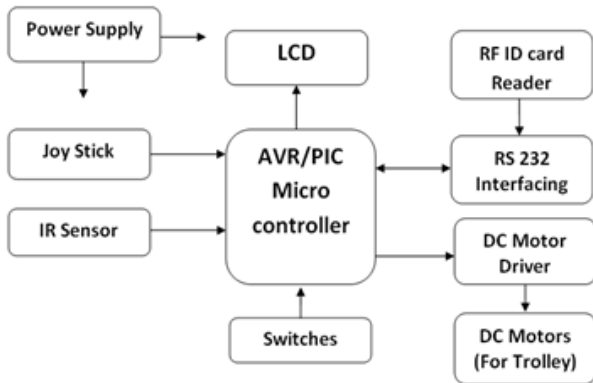
There are some existing methods to solve the problems that are stated above but the effectiveness still consider improvable. Examples of existing problem solving techniques are substituting the conventional way of keying item per item by hand to the cash register with the technology of barcode scanning where the price are stored in the barcode, and also set up a customer nformation counter to help the consumer if there are any enquiries about

the items at shopping mall.

PROBLEM FORMULATION

Instead of RFID tags we can use Barcode scanner for more accuracy. Remote control handling can be eliminated using GPS system.

BLOCK DIAGRAM AND EXPLANATION



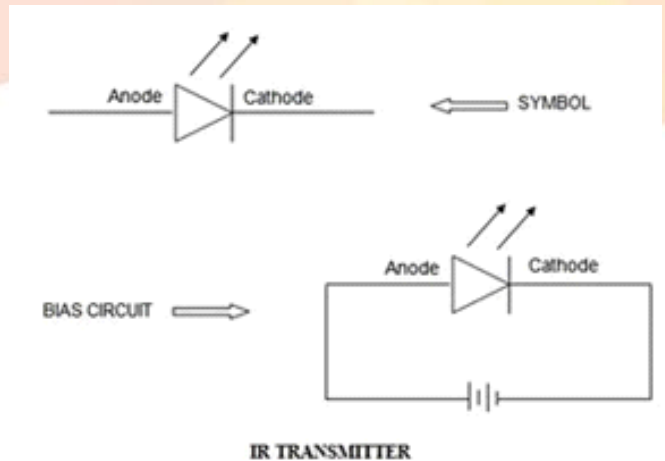
PIC MICROCONTROLLER

LCD (Liquid Crystal Display) –

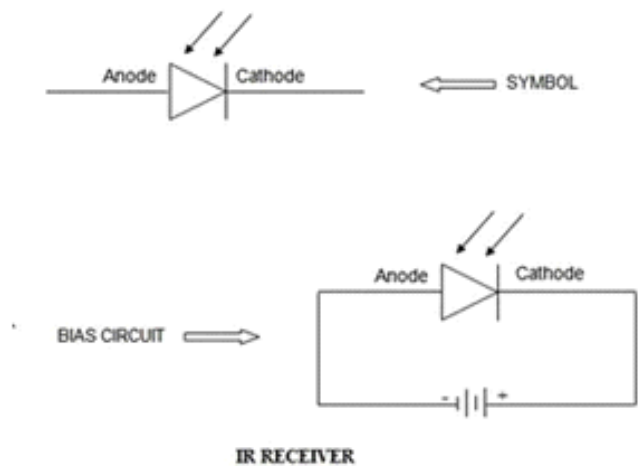
LCD which is normally known as Liquid Crystal Display & Alphanumeric Presentation it means that it can show Letters, Amounts as well as different codes thus LCD is a user kindy Show method which can be used for showing many communications different seven section show which can show only quantities and some of the letters

IR transmitter:

An electroluminescent IR LED is a product which requires care in use. IR LED's are fabricated from narrow band hetero structures with energy gap from 0.25 to 0.4 eV. Infra red transmitter emits IR rays in planar wave front manner. Even though infra red rays spread in all directions, it propagates along straight line in forward direction. IR rays have the characteristics of producing secondary wavelets when it collides with any obstacles in its path. This property of IR is used here.



IR receiver:



Infrared photo receiver is a two terminal PN junction device, which operates in a reverse bias. It has a small transparent window, which allows light to strike the PN junction. A photodiode is a type of photo detector capable of converting light into either current or voltage, depending upon the mode of operation. Most photodiodes will look similar to a light emitting diode. They will have two leads, or wires, coming from the bottom. The shorter end of the two is the cathode, while the longer end is the anode.

RFID Tag

A radio-frequency identification system uses tags, or labels attached to the objects to be identified. Two-way radio transmitter-receivers called interrogators or readers send a signal to the tag and

read its response.



Fig. RFID Tag

RFID tags can be either passive, active or battery assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery assisted passive (BAP) has a small battery on board and is activated when in the presence of a RFID reader. A passive tag is cheaper and smaller because it has no battery. Tags may either be read-only, having a factory-assigned serial number that is used as a key into a database, or may be read/write, where object-specific data can be written into the tag by the system user. Field programmable tags may be write-once, read-multiple; "blank" tags may be written with an electronic product code by the user. An RFID system is specifically designed to be asymmetric the reader is big, expensive and power hungry compared to the RFID tag. There are a number of different types of RFID system, but one basic categorization is based on the power source used by the tag. Passive tag RFID systems require no power source at the tag – there is no battery. Instead, the tag uses the energy of the radio wave to power its operation, much like a crystal radio. This results in the lowest tag cost, but at the expense of performance.

RFID tag reader

RFID reader is used to read the data's present in the RFID tag. RFID readers or receivers are composed of a radio frequency module, a control unit and an antenna to interrogate electronic tags via radio frequency (RF) communication. Many also include an interface that communicates with an application. Readers can be hand-held or mounted in strategic locations so as to ensure they are able to

read the tags as the tags pass through an "interrogation zone." RFID systems can be classified by the type of tag and reader. A Passive Reader Active Tag (PRAT) system has a passive reader which only receives radio signals from active tags (battery operated, transmit only).

RS 232 protocol

RS 232 protocol is used for serial communication in between AVR to PC. In our project the master is connected to the PC via RS-232.

Motor



Electrical motors are everywhere around us. Almost all the electromechanical movements we see around us are caused either by an A.C. or a DC motor. Here we will be exploring this kind of motors. This is a device that converts DC electrical energy to a mechanical energy.

Buzzer



Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

Robust system, low power requirement.

LCD module

LCD is used to display the moisture content & the solenoid valve on off status.

Crystal Circuit

This crystal circuit gives the required clock pulses to the microcontroller to give it the sense of the reference time

Reset Circuit

This circuit gives the microcontroller the starting pulse required to start the operation from the start. Unless this pulse is given, the microcontroller doesn't start functioning

Power supply

The 230A.C input is given to rectifier circuit and Output get from the rectifier is a pulsating D.C voltage. The output from the rectifier is given to a filter circuit to filter A.C components present constant later than rectification. Now, this voltage fed to voltage regulator to pure constant D.C voltage get.

SOFTWARE DESCRIPTION

This project is implemented using following software's:

- 1.Express PCB – for designing circuit
- 2.PICC compiler - for compilation part
- 3.Proteus 7 (Embedded C) – for simulation part.

ADVANTAGES

- * Efficient way for shopping in malls
- * Less time delays
- * Quick response time
- * Fully automate system