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Inventory Monitoring System in Shopping Mall Using IOT

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ABSTRACT

This project IOT Inventory Monitoring system is a very innovative system which will helps in shopping mall to monitoring respective products stocks and if it gets lower to the given level it will straightly inform the suppliers to check stocks. This system monitors the inventory and various other products too and informs about the level of inventory collected in the inventory via a web page. For this the system uses ultrasonic sensors placed over the container to detect the inventory level and compare it with the inventory containers depth. The system makes use of AVR family microcontroller, LCD screen, Wifi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of inventory collected in the container. Where as a web page is built to show the status to the user monitoring it. The web page gives a graphical view of the inventory bins and highlights the inventory collected in color in order to show the level of inventory collected. The system puts on the buzzer when the level of inventory gets below the set limit. Thus this system helps to keep the vendors updates about the inventory by informing about the inventory levels of the container by providing graphical image of the products via IOT Gecko web development platform.

Keywords: IOT, Inventory Monitoring, Wifi modem.

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I. INTRODUCTION

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IOT is a new concept booming in this generation of technology and yet more interesting thing to learn and implement this technology in our project. It will surely help us in the future and to undergo this technology in future. We are taking this technology as a motivation to work on it and to develop useful information for the future reference.

II. BACKGROUND HISTORY

A. Literature review on models of inventory systems under uncertainty.

Inventories are raw materials, work-in-process goods and completely finished goods that are considered to be the portion of business's assets that are ready or will be ready for sale. Again considering the reliability of any process is an important feature in the research activities. Values of some factors are very hard to define or almost unreal. This paper analyzes possible parameters of existing models of inventory control. An attempt is made to provide an up-to-date review of existing literature, concentrating on descripting of the characteristics and types of inventory control models that have been developed.

B. Inventory management system

This paper of Inventory Management System is a real-time inventory database improved technology capable of connecting multiple stores. Proposed system can be used to track the inventory of a single or small store. However, past inventory data and provides notification of low stock at any location through email at a specified interval. Their goal was to reduce the strain of tracking rather than to handle all store maintenance. Further features may include the ability

to generate reports of sales, but again the interpretation is left to the management.

III. PROPOSED SYSTEM

Proposed system consist of single way communication which is from sensors capturing required data and sends to webpage to flash important data to the users.

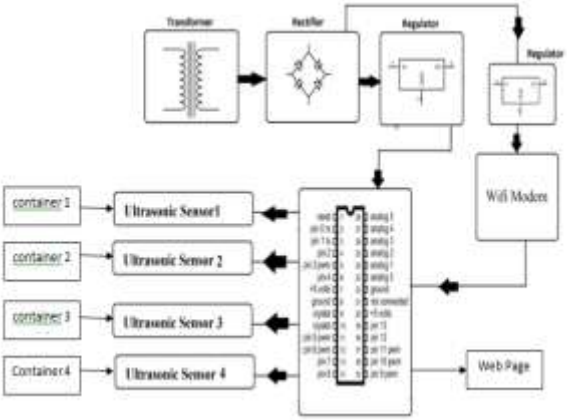

Fig 1 Block diagram of a system

In this proposed system we are collecting the information from respective sensors, which is to be interfaced to IOT module to the web page. Web page shows the graphical representation of the inventory in the shopping mall. As we know in various shopping mall, system is there to calculate the stocks in the billing section, when we buying the respective inventory it will automatically deduct the quantity in the system in real time. But in this system, we are using internet to monitoring in the form of web page to managing various inventory at the same time indication.

IV. CIRCUIT DIAGRAM

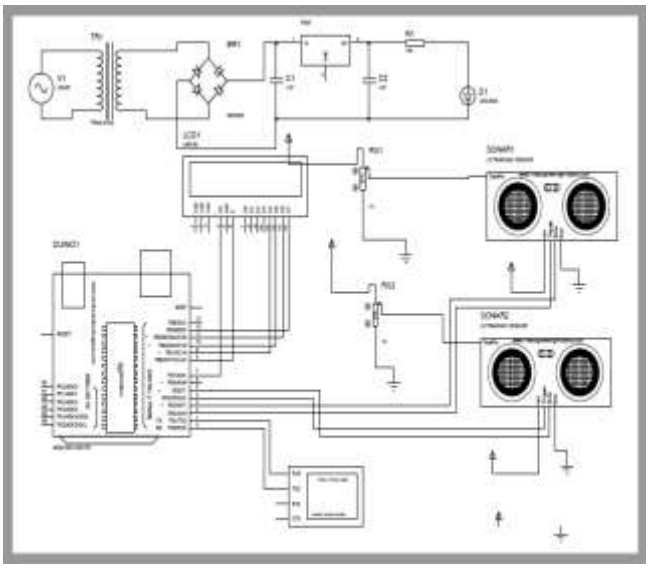

Fig 2 Circuit Diagram of Proposed Unit

V. COMPONENT REQUIREMENT

A. HARDWARE

In our proposed system we can use **AVR ATMEGA32 Microcontrollers** as follows:

Features:

Atmega32 has got 40 pins. Two for Power (pin no.10: +5v, pin no. 11: ground), two for oscillator (pin 12, 13), one for reset (pin 9), three for providing necessary power and reference voltage to its internal ADC, and 32 (4×8) I/O pins.

About ATmega32 is capable of handling analogue inputs. AVCC & GND together can make an ADC channel. No pins can perform and serve for two purposes (for an example: Port A pins cannot work as a Digital I/O pin while the Internal ADC is activated) at the same time. It's the programmers responsibility to resolve the conflict in the circuitry and the program. Programmers are advised to have a look to the priority tables and the internal configuration from the datasheet.

Digital I/O pins: Atmega32 has 32 pins (4portsx8pins) configurable as Digital I/O pins.

Timers: 3 Inbuilt timer/counters, two 8 bit (timer0, timer2) and one 16 bit (timer1).

ADC: It has one ADC in which total 8 single channels are selectable. They can also be used as 7 (for TQFP packages) or 2 (for DIP packages) differential channels. Reference is selectable, either an external reference can be used or the internal 2.56V reference can be brought into action. There external reference can be connected to the AREF pins.

Communication Options: Atmega32 has three data transfer modules embedded in it. They are:

- Two Wire Interface
- USART
- Serial Peripheral Interface

Selection Criteria For AVR Microcontroller

- APPLICATION AREA – Best suited for our system. Resistant to noise, vibrations, dust, temperature changes etc.
- PRICE – Inexpensive compared to other options available.

IOT MODULE:

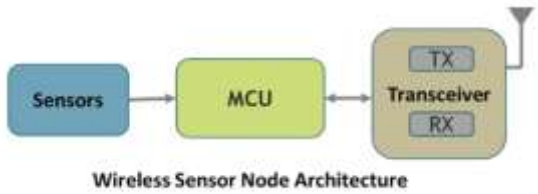

Fig 3 IOT Sensor architecture

IoT systems is a processor unit or microcontroller (MCU) that processes data and runs software stacks interfaced to a wireless device for connectivity. Requirements for both the MCU and wireless device are specific to the end application and system requirements. Proposed system IoT sensor nodes consolidate sensor functions and use an 8-bit MCU or a 32-bit device to run a small radio frequency (RF) protocol stack. These devices are typically battery powered and connect to gateways where heavier processing and data transmission

occurs. The devices must be portable, reliable connected and able to operate under varied environmental conditions regardless of RF interference or physical barriers. Because these devices are part of networks, the setup of networks, aggregation of sensor data and display of information must also be considered.

ULTRASONIC SENSORS:

Fig 4 Ultrasonic sensor

The sensors we are using is a 4 pin sensor, one for Vcc, one for ground and the other two pins are echo and trigger However there are sensors, that have three pins, Vcc, ground, and the third pin to connect to microcontroller. The working principle is pretty much the same, but it will have one input lines instead of two and also since the number of input line has changed, the coding will also changed, but the main logic will remain the same.

B. SOFTWARE

ASSEMBLY

For microcontroller we use arduino id for programming simulation.

Circuit

In our system we can use Proteous 8.0 for Circuit Designing.

PCB layout

In our system For PCB Layout Eagle 7.2 is used.

VI. SIMULATION RESULT

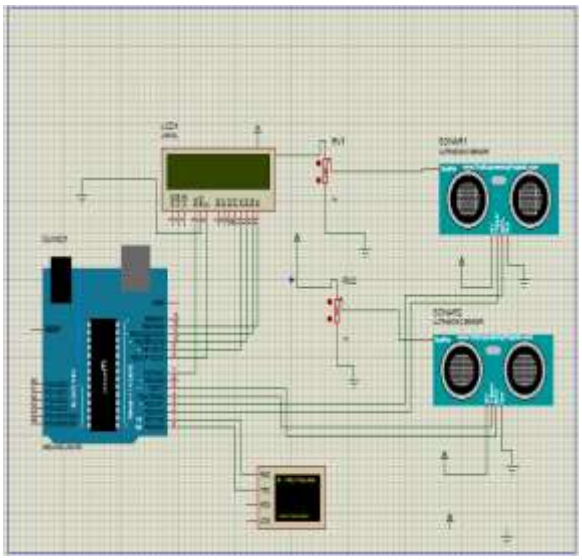

Fig 5- simulation

Memory of the atmeg382 divided into 3 types of memories:

Program memory
Data memory
Data EEPROM

Each one of them has a different role. Program Memory and Data Memory two memories that are needed to build a program, and Data EEPROM is used to save data after the microcontroller is turn off.

• Program Memory - A memory that contains the program (which had been written), after it has been burned. As a reminder, Program Counter executes commands stored in the program memory, one after the other.
• Data Memory – This is RAM memory type, which contains a special registers like SFR (Special Faction Register) and GPR (General Purpose Register).
The variables that are stored in the Data Memory during the program are deleted after turning off the microcontroller.
• Data EEPROM (Electrically Erasable Programmable Read-Only Memory) - A memory that allows storing the variables as a result of burning the written program. Program Memory and Data EEPROM they are non-volatile memories, which store the information even after the power is turn off. These memories called Flash or EEPROM.

VII. PCB LAYOUT

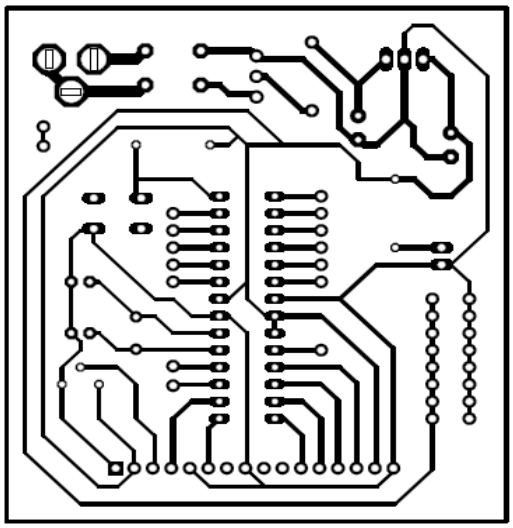

Fig. 6 PCB Layout

VIII. SUMMARY

In proposed system, a novel idea is proposed for controlling the wastage of the inventory by imposing the IoT technology even to monitoring the products in favor of users and store supervisors. From literature survey it is summarized that, with this system it is possible to improve digitally collections and monitoring.
While the concept of combining computers, sensors, and networks to monitor and control devices has been around for decades, the recent confluence of key technologies and market trends is ushering in a new reality for the “Internet of Things’’. IoT promises to usher in a revolutionary, fully

interconnected "smart" world, with relationships between objects and their environment and objects and people becoming more tightly intertwined. The prospect of the Internet of Things as a ubiquitous array of devices bound to the Internet might fundamentally change how people think about what it means to be "online".

REFERENCES

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