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ADVANCED OFFER MANAGEMENT SYSTEM FOR SHOPPING MALLS BASED ON ANDROID AND IOT

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Abstract:

Now a days the offers and the availability of the offered products in shopping malls are not intimated to the customer. So, there is an inconvenience for the consumer. So, to avoid the above-mentioned inconveniences, this concept introduces a completely automated shopping system which works toward the automation of malls. These are follows the customer while he/she is purchasing items, all the while maintaining safe distance from the customer. The RFID reader embedded in the card scans the unique tag of each set of items and corresponding data regarding the product and the total amount payable are displayed. Automated billing system provides the total bill amount. Thus, the rush at the billing section is significantly reduced. Then the customer Shopping system is reliable, effective, inexpensive and above all, user friendly.

INTRODUCTION

The past decade has seen an explosion in advancements in science and technology. Utilizing the same to ease day to day life activities of humans has been the latest paradigm and new research is seeing the light of day in this regard. Scientists are looking for ways to simplify the lifestyle of humans. Shopping centers or malls form a great source of convenience to consumers, since all the products of varying choices are found under one roof [1]. A lot of research is also being carried out in the retail sector, to make shopping a more memorable experience. This would not only help consumers but also improvise the economic inflow of such shops as well. Nowadays, shopping carts are essential for purchasing items. After this procedure, customer has to wait in queue for billing. In this modern era, for automation of malls we are developing a micro-controller based cart which is totally automatic. Micro-controller based design has acquired the status of the most happening field in electronics. The cart follows the customer while purchasing items and maintains safe distance between customer and itself. Radio frequency identification reader reads the tag corresponding to each product and the corresponding data regarding product will be displayed on display. By using this card, customer can buy large number of products in less time with minimum effort and then timing management is currently updated to the system so the customers are that much of time they will go to shop and reduce the wastage of time management.

EXISTING SYSTEM

In the previous system, different types of technologies are used in the mall management system. Every processes were done manually by the malls which consumes a lot of man power and energy. This advanced offer management system makes works a lot more easier than before. To develop a shopping aid that assists the consumer to locate and select products and inform them on the product details in the shopping arena. Additionally, with each product identified uniquely and support maintain and inventory updates.

PROPOSED SYSTEM

This system is used to intimate the offers of the product and availability of the stock of the offered product in shopping malls for easy analysis of customer. The RFID reader embedded in the card scans the unique tag of each set of items and corresponding data regarding the product and the total amount payable are displayed[2]. This concept introduces a completely automated shopping system which works toward the automation of malls. The RFID reader embedded in the card scans the unique tag of each set of items and corresponding data regarding the offer, stocks remaining and the availability of the product which reduces the wastage of time done in window shopping. The Intelligent Shopping system is reliable, effective, inexpensive and above all, user friendly[as shown in fig1.0]

HARDWARE REQUIREMENTS

- Arduino Microcontroller
- RFID Reader
- ESP 8266 (Wi-Fi Module)
- Mobile Phone

SOFTWARE REQUIREMENTS

- Arduino IDE
- Proteus 8

BLOCK DIAGRAM

Fig 1.0

DESIGN FLOW OF CONCEPT

- Step 1:
  Hardware : To interface an RFID reader to the PIC microcontroller using UART protocol.
- Step 2:
  To process the RFID data in the controller and sends the data to http server (using ESP8266).
- Step 3:
  Server maintains a database and run backend for android application.
- Step 4:
  Android application runs based on data given by server.

ARDUINO MICRO-CONTROLLER

Arduino which makes the application more accessible with a single board micro-controller, interactive objects and its surrounding[3]. The hardware features an open-source hardware board designed around an 8-bit Atmel AVR micro-controller or a 32-bit Atmel ARM[as shown in fig1.2]. A current model consists of a USB interface, 6 analog input pins and 14 digital I/O pins that allow the user to attach various extension boards. The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which PMW using 6 outputs, ceramic resonator using 16MHZ,

an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable or with an AC-to-DC adapter or battery. Arduino Uno Board varies from all other boards and they will not use the FTDI USB-to-serial driver chip in them[as shown in fig 1.1]. It is programmed as a USB-to-serial convertor and featured by the Atmega16U2 (Atmega8U2 up to version R2).

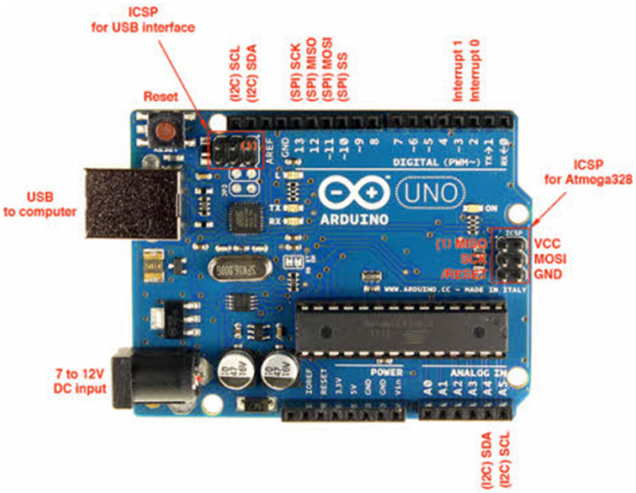

Fig 1.1

ARDUINO UNO

This is the Arduino Uno R3. In addition to all the features of the previous board, the Uno now uses an ATmega16U2 instead of the 8U2 found on the Uno[4].This allows for faster transfer rates and more memory. No drivers needed for Linux or Mac (inf file for Windows is needed and included in the Arduino IDE), and the ability to have the Uno show up as a keyboard, mouse, joystick, etc.

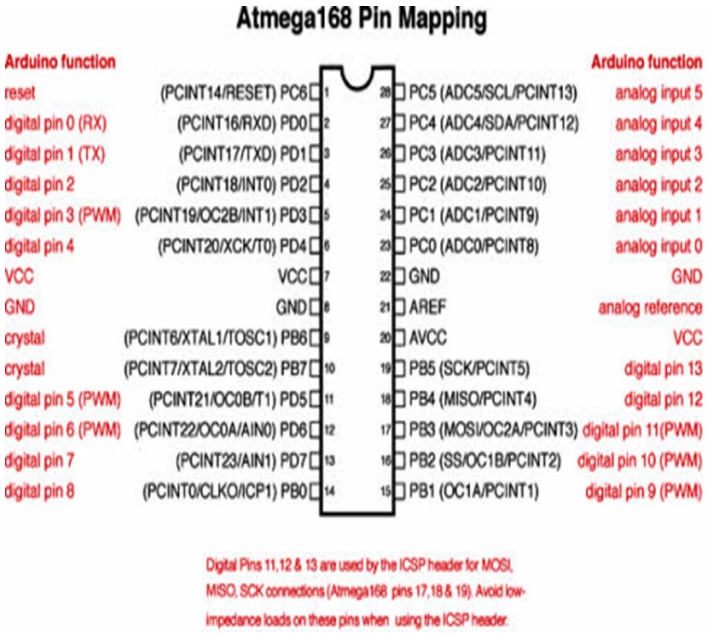

Fig 1.2

FEATURES OF UNO

Microcontroller: ATmega328

Operating Voltage: 5V

Input Voltage (recommended): 7-12V

Input Voltage (limits): 6-20V

Digital I/O Pins: 14 (of which 6 provide PWM output)

Analog Input Pins: 6

DC Current per I/O Pin: 40 mA

DC Current for 3.3V Pin: 50 mA

Flash Memory: 32 KB of which 0.5 KB used by bootloader

SRAM: 2 KB (ATmega328)

EEPROM: 1 KB (ATmega328)

Clock Speed: 16 MHz.

ACTIVE RFID

Active radio frequency identification (RFID) is a wireless, identification of automatic method which is used through broadcast information with self-powered about its location and the identity[as shown in fig2.0(a)]. The battery powers the RFID circuit and it enables the active RFID tag[as shown in

fig2.0(b)], to transmit identified information, either by continuously or beaconing a tag reader or when prompted to do so by a reader. Active RFID tags are used to automatically identify, locate, track, monitor, humans and animal. An active RFID can be programmed to send a signal on demand, or transmit at set intervals. When a change in a sensed parameter the tags will active to start transmitting at certain location then it will detect. The change could be in temperature, humidity or movement. Active RFID systems operate at ultra-high frequencies and have long read ranges of up to 100 M. The devices have a memory capacity of 512 kb or more, which allows the active tag to store asset information directly from the tag.

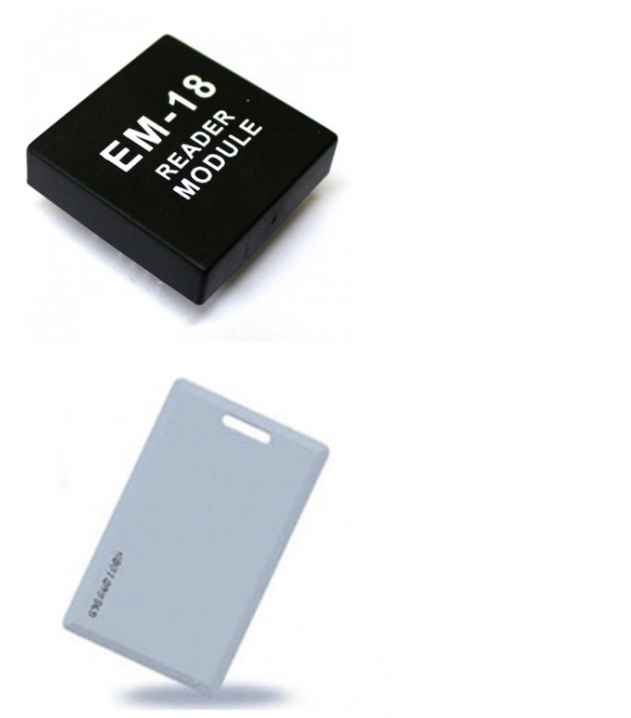

Fig 2.0(a),(b),(c).

ESP 8266(Wi-Fi MODULE)

It can use both TCP and UDP for file transmission. This module integrates a 32 bit RISC processor. there is no internal ROM storage thus external flash This wifi module[as shown in fig3.0] works at an operating frequency of 2.4GHZ.The ESP module works at an input voltage of 2.5v to 3.6v DC. The module uses 802.11 wireless protocol.it also support p2p protocol and usart protocol for serial communication and parallel communication. This module has an internal cache memory thus improvising the storage space. this can be also used to serve as an internet serive ro the micro memory can be used upto 16MB. The high frequency clock drives from crystal generator. The transmitter and receiver uses a 2.4GHZ band. There are 17 GPIO pins for various functions, these pins can be multiplexed with other protocols such as I2C,I2S,UART.

Fig 3.0

ARDUINO IDE

There are various components in Arduino. In Arduino family it is the most popular board. In addition, it is the best board to get started with electronics and coding. Some boards look a bit different from the one given below, but most Arduino have majority of these components in common.

Various kinds of Arduino boards are available depending on different microcontrollers used. .

However,there are only few things in common.the possible common things are data pins and address pins. they are programed through the Arduino IDE. The differences are based on the number of inputs and outputs (the number of sensors, LEDs, and buttons you can use on a single board), speed, operating voltage, form factor,no.of interrupt,no.of analog to digital convertors etc. Some boards are designed to be embedded and have no programming interface (hardware), which you would need to buy separately. Some can run directly from a 3.7V battery, others need at leas.

Arduino is a prototype platform (open-source) based on an easy-to-use hardware and software. It consists of a circuit board, which can be programed (referred to as a microcontroller) and ready-made software called Arduino IDE (Integrated Development Environment), which is used to write and upload the computer code to the physical board.

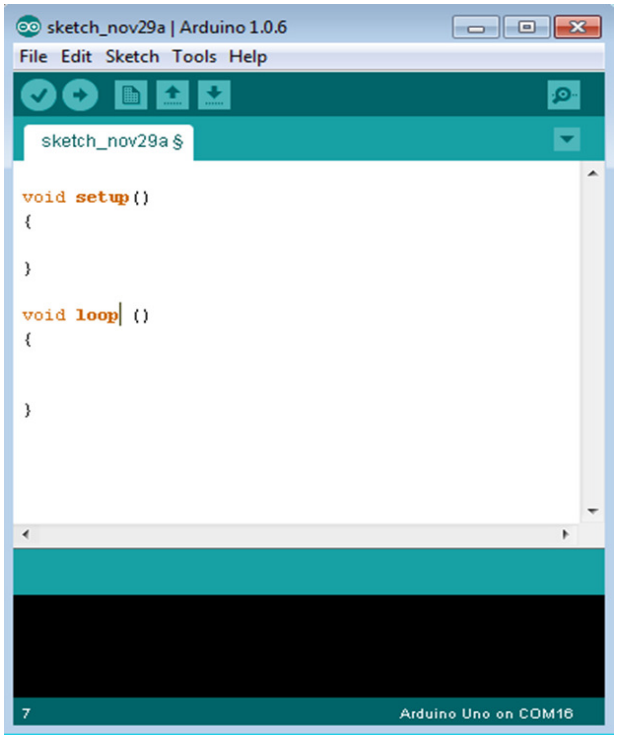

Fig 4.0

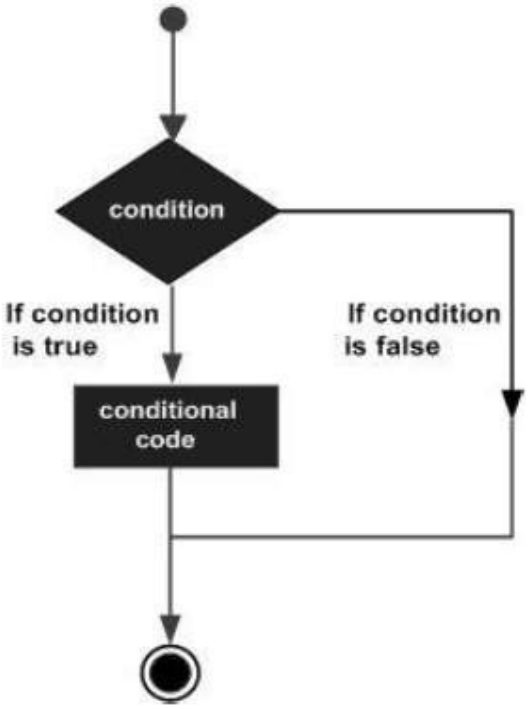

Fig 4.1

PROTEUS 8

It contains software suites like **schematic**, **simulation** and **PCB designing** [5].

- **ISIS** is the software used to draw schematics and simulate the circuits in real time[as shown in fig5.0]. The simulation allows human access during run time, thus providing real time simulation.
- **ARES** is used for PCB designing. It has the feature of viewing output in 3D view of the designed PCB along with components.
- The designer can also develop 2D drawings for the product.

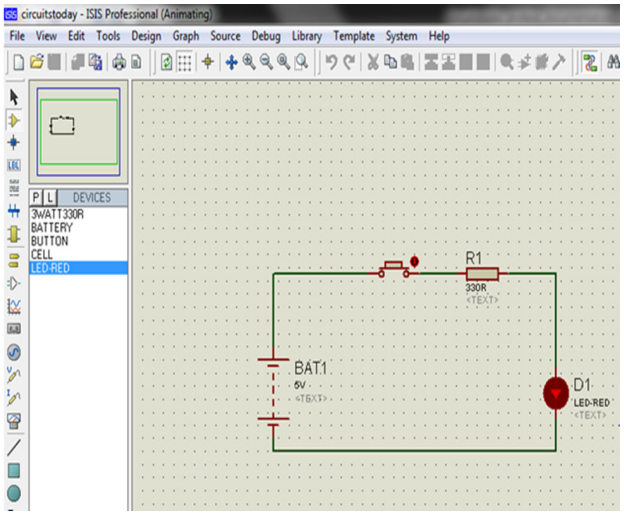

Fig 5.0

CONCLUSION

Intelligent shopping card proves to be user friendly, time saving and economic. As the proverb says 'Time and Tide waits for no one' the intention of the work was to reduce the effort and time spent on shopping and to make it a memorable experience. The automated controlled by a microcontroller was able to follow the user and equipped with on board billing system and time maintenance system. The system eliminates the long hard queues for billing after purchase. In this era where humans are investing more on technology for their comfort, intelligent shopping cart is worth marketing. Additional features like on-line payment can be incorporated with the cart by transferring the purchase details to the central computer through any wireless transmission medium and automated inventory management can be accomplished with the same.

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