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Smart Vending Machine

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Abstract: ***Now-a-days vending machines are becoming very popular in western countries because of their ease, less wastage of time and effort, availability near doorstep and variety of products. But in India, vending machines are still not so popular according to the customer's requirement. In this paper, a model of vending machine is proposed which dispenses liquid products by accepting the coin. The model of vending machine is customer friendly with a feature of fake coin detection. This machine is implemented using AVR ATmega16 microcontroller. Various modules of the machine are interfaced with the microcontroller. Coin recognition through CS-616 coin acceptor and IR sensor makes this model simple and inexpensive as compared to the previous work where either currency or tokens were used or difficult techniques like image recognition for detection of coin.***
Keywords: Atmega16,IR sensor, CS-616 Coin acceptor

I. INTRODUCTION

Beverages like Tea and coffee have become a part of a daily routine of people around the world. Employees at an MNC or a relatively small industry, everyone wants to have a cup of their favorite beverage daily. While an MNC can afford to have beverages ordered from their high end canteens, a small office cannot. Small offices depend on a roadside stall to fulfill their beverage requirements.The objective of the project is to design and develop a Tea,Coffee and Juice vending machine, which dispenses the beverage of required quality in less time as per customer requirement.

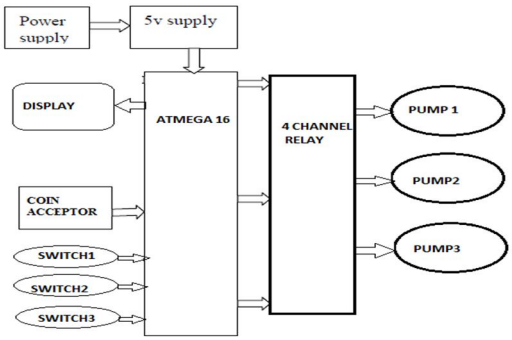
II. LITERATURE SURVEY

1) The Internet of Things Coffee Vending Machine Zhen Lei Yang, Ling Yun Zhao, LiangtianGu, 2015 Trans Tech Publications, Switzerland, In the paper the author has put forward the design of the coffee vending machines based on the technology of internet of things and its remote management system, which is focusing on current problems occurring in existing system such as difficulties in analysing data and really high cost of administration.This design not only makes the sales and supply information available, it can survey this information into cloud corner through GPRS as well.

2) IoTBased Coffee Quality Monitoring and Processing System in Rwanda Joachim Rutayisire, Sandor Markon and Ndacyayisaba Raymond Coffee is main source of income, thus improving processing and monitoring has a large potential economic impact, in this paper they have introduced low-cost sensor Technology, by utilizing embedded system to monitor coffee washing station processing method and store centres,the system will be reporting the status of PH, moisture, temperature and humidity as basic information to keep the standard quality of coffee, continually monitor these stages and alerting right time to move from one stage to another to meet requirement of export market.They believe that similar technologies could be beneficent in local coffee processing anywhere else with similar conditions.

3) Kaushal Mahesh Ambani, Harshil Mayur Gandhi, Priyank Jayesh Shah,Automatic Ticket Vending via Messaging Service (ATVMS),in March 2012 International Journal of Computer Applications. This paper provides a brief glance at ATVMs (Automatic Ticket Vending Machines) and (CVM) Coupon Validating Machines; technologies which are already implemented in the Mumbai Suburban Railways, along with a statistical insight of its drawbacks.

III. METHODOLOGY



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The above block diagram shows the various modules used in the model of vending machine. IR sensors are used to detect the coins so that if any other fake coin is inserted then it is recognized. Switches are also used to select the required drink as per customers requirement. LCD is used to display each step for the process. The switches are used to give the order and the relays are used to give liquid output through pumps/nozzles.

A. Software used

1) *Proteus 8.11:* Professional Proteus is a proprietary software toll used primarily for electronic design automation. It has modules for schematic capture, simulation and PCB layout design. All PCB Design products include an auto-router and basic mode SPICE simulation capabilities. The 3D viewer module allows the board under development to be viewed in 3D together with a semi-transparent height plane that represents the board's enclosure. STEP output can then be used to transfer to mechanical CAD software for accurate mounting and positioning of the board.
2) *Atmel Studios:* Atmel studio provides a complete set of features including file management, task management and version control integration (CVS), a C/C++ editor with syntax highlighting, navigation and code compilation, a debugger supporting run control including source and instruction level stepping and break point.

IV. RESULTS

The result can be described in three different sections:
First is the coin detection section. When the coin is inserted it comes across the CS-616 coin acceptor and IR sensor which detects the coin using thus recognizing that it is not a piece of paper or other metal. The size of Rs.10 coin is identified by using two pairs of IR sensors one at the beginning of insertion and the other at the end equal to the currency length. (Size 137*63mm of Rs.10)
Second section is the placing of order.First the LCD displays to insert the coin.Then the customer inserts the coin.When 10 rupee coin is detected, the LCD displays select your drink else if not detected displays wrong coin inserted..
Last section is the dispensing of required beverage. When we select the button, the relay gets activated and liquid output is dispensed into the cup. The time is already adjusted according to the size of cup so that liquid does not flows out.

V. CONCLUSION

The model of the vending machine successfully detects the coin and dispenses liquid output. It is also proved to be customer friendly. The system developed in this research work can be used as a base for future development.

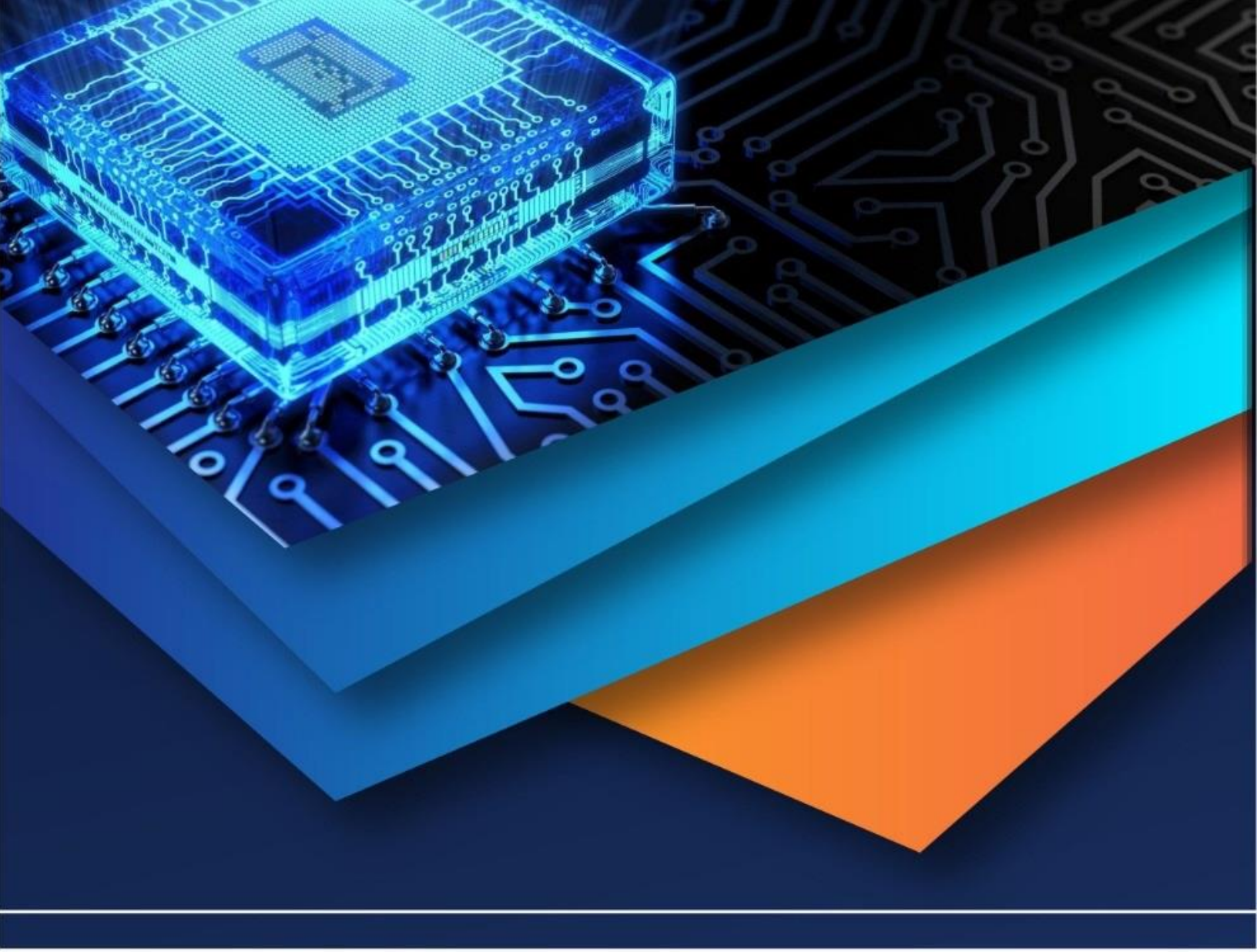
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