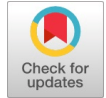


# Automatic Cold Drink Vending Machine with Reverse Vending System for Empty Bottles and Monitoring System using VLSI



J.Narendra Babu, Vaibhav V. Khandare, Rohan A.Chougule, M.A.Chimanna.

**Abstract:** now days the Plastic is one of the most versatile material. These days the waste generated by humans. In this paper we develop the VM and RVM . A VM is an automated machine that provides three different types of items such as coca cola, sprite and thumbs-up etc. the money is inserted to consumers in to the machine. The reverse vending machine is the machine that accepts empty plastic bottles and credits discount offer. The collected empty plastic bottles are sent for further recycling which is environment friendly. Operation of the machine exhibited accuracy in recognizing barcode data, distinguishing between vend plastic bottle and other plastic bottles, storage update. The machine is able to run on commercial power. All the mentioned process will be controlled by a PIC microcontroller. Throughout the process barcode sensor is responsible to Identify vend plastic bottles. The developed project is environment friendly and cost effective.

**Keywords:** Vending Machine, barcode Scanner, Coin Acceptor module, Reverse vending machine, monitoring system

## I. INTRODUCTION

We all know that plastic is how much dangerous to human being. The main problem found by us is critical in managing plastic bottles. The nature is littered by plastic wastes. We hope to make a product that can vend and also collect plastic bottles for recycle. For further deform or grinding the plastic is going for recycling. Main problems caused by plastic pollution are waste and environmental problem in our contemporary society. That's why we decided to make the machine that can vend plastic cold drink bottles as well as collects that empty plastic bottles, by bar code scanning method The first modern coin-operated VM is introduced in London in the United Kingdom in early 1880's. At earlier time the vending machine is only vend the products. In this project the vending machine that sells cold drinks such as juice, bottled water, soft drinks. So it is needed to collect vended plastic bottles again so that can reduce production of plastic

Manuscript published on 30 September 2019.

\*Correspondence Author(s)

**Dr.J.Narendra Babu\***, Professor, Department of E&TC, Sharad Institute of Technology, College of Engineering Yadrav, Ichalkaranji.  
Email: myece88@gmail.com

**VaibhavV.Khandare,Asst.Professor**, Department of E&TC. Sharad Institute of Technology, College of Engineering Yadrav, Ichalkaranji.  
Email: khandare.vv@gmail.com

**RohanA.Chougule, Asst.Professor**, Department of E&TC. Sharad Institute of Technology, College of Engineering Yadrav, Ichalkaranji.  
Email:rachowgule@gmail.com

**M.A.Chimanna\***, Asst.Professor, Department of E&TC, Sharad Institute of Technology, College of Engineering Yadrav, Ichalkaranji.  
Email: mohanchimanna1008@gmail.com

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Thus reuse of plastic helps to protect our environment as well As humans health .in this paper proposed that the combination of vending machine and reverse vending machine with monitoring system.

## II. LITERATURE REVIEW

The machines whichever developed earlier are listed as below:

- Vending machine based on the short message payment with the main control module M68HC11 and GPRS module MC35.
- Automatic medicine dispensing machine.
- Hot Bread Vending Machine.
- Ice Cream Vending Machine.

The proposed vending machines can vend plastic cold drink bottles as well as collect that empty plastic bottles, by bar code scanning method and monitoring system. In market similar kind of products are available but there is Human health. This project proposed that the combination of vending machine and reverse vending machine with monitoring system.

## III. VENDING MACHINE & REVERSE VENDING SYSTEM WITH MONITORING SYSTEM

A. The main components of the Vending system are

- a. Microcontroller
- b. Servo Motor (3)
- c. LCD
- d. Coin Acceptor module
- e. AC to DC Power Supply Board
- f. Keypad

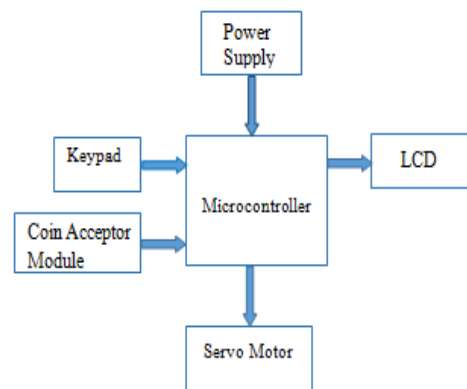


Fig1. Vending Machine



# Automatic Cold Drink Vending Machine with Reverse Vending System for Empty Bottles and Monitoring System using Vlsi

The coin acceptor will take the Coin by sensing the thickness, diameter and fall time of the coins to identify them and rejects incorrect coins. After the selection of Cold drink bottle by the help of keypad, the microcontroller will make the Servo Motor to run. The Servo Motor will push the particular bottle out. The instructions and status of the operation will be display on LCD. Each bottle using unique barcode which is already saved.

## B. The main components of the Reverse Vending system & Monitoring system is

- Microcontroller
- Servo Motor
- LCD
- Barcode Scanner
- AC to DC Power Supply Board
- Thermal Printer
- LDR
- Monitoring Unit

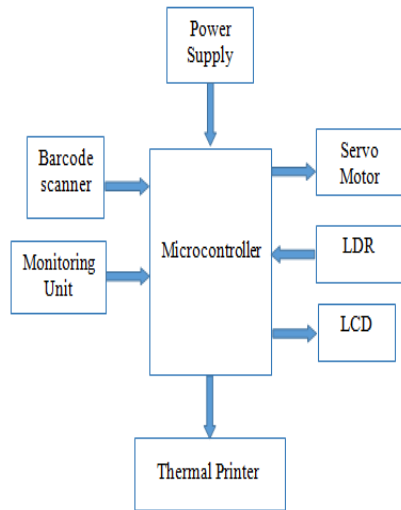


Fig2. Reverse Vending Machine

Reverse vending system will accept the empty plastic bottle only after the bar code scanning. If the barcode match to the already saved barcode then microcontroller will allow servo motor to run this opens the shutter to take the bottle in. To check whether bottle is fall in to the container or not, the LDR is used. The Monitoring system continuously monitors the level of bottles in the container. When bottles in the container goes to the certain level the monitoring system gives alert by beeping and when the container get full, monitoring system allows microcontroller to stop the reverse vending system.

## IV. ALGORITHMS OF STATE MACHINE DIAGRAM

### A. Vending Machine:

Vending system consists of only one state in which it takes coin as an input. If the detected coin is correct, the bottle will come out. If the detected coin is not correct then it will again go to the initial state.

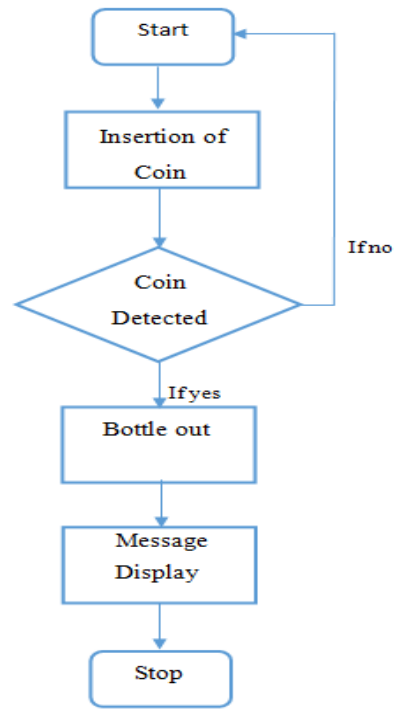


Fig3. Flow Chart of Vending Machine

## V. RESULTS

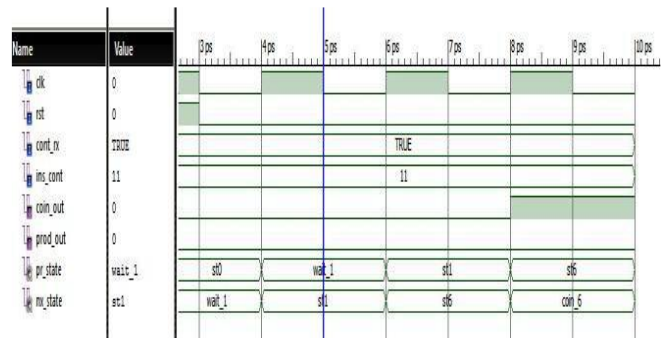


Fig 4. Simulation Results for Vending Machine

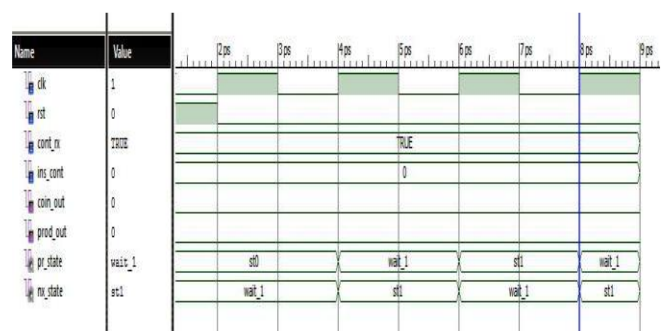


Fig 5. Simulation Results for RVM

## VI. CONCLUSION

This system has set out the vision of making a clean environment free of littered plastic pet bottles. In this paper The existing system has no combined vending and reverse vending systems with monitoring system, also there is no bar code scanning system.

So we decided to make the machine that can vend plastic cold drink bottles as well as collects that empty plastic bottles, by bar code scanning method.

in the market it can be introduced at public and private places such as Airports, shopping malls Railway stations etc. In future we are planning to issue Debit Cards as well as to interlink online bank accounts for funds transfer.

## REFERENCES

1. Vaild Varun, "the various attributes in modeling a FSM based reverse vending and vending machine in 2 different styles", national Conference on Embedded Systems (ICES), 2014.
2. Kwangsoo, "Smart vending machine using actuator and sensor networks", ICCE , IEEE, 2014.
3. Krishna V. V., Monisha A., Sadulla S.&Prathiba J, "Design and implementation of an automatic beverages vending machine and its performance analysis messurmtnt Xilinx ISE and Cadence", Fourth International Conference on Computing, Communications and Networking Technologies(ICCNT), 2013.
4. R.S. Khurmi&J.K.Gupta, Machine Design, Manufacturing Considerations first Edition

## AUTHORS PROFILE



**Dr.J.Narendra Babu** have completed his BTech, MTech and PhD in Electronics and communication engineering from reputed institutions. He have total 20 years' experience in teaching and industry. He worked in industry as a software engineer and project manager. That time he gained much knowledge in programming and database.in teaching he worked as professor, principal and academic director in various reputed institutions. He was a reviewer in number of ugc international journals and also acting as member

in editorial board in international journals. He have good knowledge in image processing, signal processing and matlab.present he is working as professor and head of department in SITCOE, Yadrav, MS. He is distributing his knowledge to students in many ways. He is well qualified faculty and good administrator. He is learning to students how write the papers and how do the good research work in teaching.



**Mr.Vaibhav V Khandare** completed his B.E and M.E in Reputed Institutions. He have good' experience in teaching.. He have good knowledge in Electronics and telecommunication engineering. Present he is working as Assistant professor in E&TC Department, SITCOE, Yadrav, MS. He is distributing his knowledge to students in many ways. He is teaching to students how write the papers and how do the good research work in

teaching.



**Mr .Rohan A. Chougule** has completed his BE and M.E in Reputed Institutions and now he is pursuing Ph D. He have good' experience in Teaching as well as Industry. He has good knowledge in Electronics and Telecommunication engineering. Presently he is working as Assistant Professor in E&TC Department of SITCOE, Yadrav,(MH). He is distributing his knowledge to students in many ways.



**Mr.M.A.Chimanna** completed his BE and M.E in Reputed Institutions. He have good' experience in Industry and teaching.. He have good knowledge in Electronics and telecommunication engineering. Present he is working as Assistant professor in E&TC Department, SITCOE, Yadrav, MS. He is distributing his knowledge to students in many ways. He is teaching to students how write the papers and

how do the good research work in teaching.